This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

B 435555 DUPL

TRANSACTIONS
OF THE
INDIANA
HORTICULTURAL SOCIETY

1900

Digitized by Google

GENERAL LIBRARY
OF
University of Michigan
Presented by
State Library of Indiana
3/17/02

Digitized by Google

SB
21
.I4

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF THE

Indiana Horticultural Society

FOR THE YEAR 1900.

BEING A

REPORT OF THE FORTIETH ANNUAL MEETING,

HELD IN THE CITY OF INDIANAPOLIS,

December 18, 19 and 20, 1900.

Together with Reports of the Summer Meeting, held in Plainfield, August 16 and 17, and of Local Societies, Selected Papers, etc.

BY JAMES TROOP, SECRETARY.

INDIANAPOLIS:
WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING,
1901.

Digitized by Google

Digitized by Google

LETTER OF TRANSMITTAL.

To his Excellency, Hon. James A. Mount, Governor of Indiana:

Sir—In accordance with the requirements of law, I have the honor to herewith present you with the fortieth annual volume of transactions of the Indiana Horticultural Society, together with such other papers as seem to be appropriate for publication in this connection.

Respectfully,

JAMES TROOP,
Secretary.

Digitized by Google

THE STATE OF INDIANA,
EXECUTIVE DEPARTMENT,
INDIANAPOLIS, January 3, 1901.

Received by the Governor, examined and referred to the Auditor of State for verification of the financial statement.

OFFICE OF AUDITOR OF STATE,
INDIANAPOLIS, January 3, 1901.

The within report, so far as the same relates to moneys drawn from the State Treasury, has been examined and found correct.

W. H. HART,
Auditor of State.

January 3, 1901.

Returned by the Auditor of State, with above certificate, and transmitted to Secretary of State for publication, upon the order of the Board of Commissioners of Public Printing and Binding.

CHAS. E. WILSON,
Private Secretary.

Filed in the office of the Secretary of State of the State of Indiana, January 3, 1901.

UNION B. HUNT,
Secretary of State.

Received the within report and delivered to the printer this 3d day of January, 1901.

THOS. J. CARTER,
Clerk Printing Bureau.

Digitized by Google

OFFICERS OF THE SOCIETY FOR 1900-1901.

PRESIDENT.

C. M. HOBBS, Bridgeport.

FIRST VICE-PRESIDENT.

MRS. W. W. STEVENS, Salem.

SECOND VICE PRESIDENT.

GEO. P. CAMPBELL, Bloomington.

THIRD VICE-PRESIDENT.

AMOS GARRETSON, Pendleton.

FOURTH VICE PRESIDENT.

J. C. GROSSMAN, Wolcottville.

SECRETARY.

PROF. JAS. TROOP, Lafayette.

TREASURER.

SYLVESTER JOHNSON, Irvington.

EXECUTIVE COMMITTEE.

E. Y. TEAS, Green's Fork.
L. B. CUSTER, Logansport.
JOE A. BURTON, Orleans.

Digitized by Google

OFFICERS OF THE INDIANA HORTICULTURAL SOCIETY SINCE ITS ORGANIZATION IN 1860.

Date.	President.	First Vice-President.	Secretary.	Treasurer.
1860	*Reuben Ragan	William Miller	Wm. H. Loomis	John C. Teas.
1861-2	*John A. Matson	*William Miller	*Wm. H. Loomis	John C. Teas.
1863	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	John C. Teas.
1864	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	John C. Teas.
1865	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	Calvin Fletcher.
1866	I. D. G. Nelson	*Joseph Orr	*Geo. M. Beeler †Samuel V. Morris	Calvin Fletcher.
1867	I. D. G. Nelson	Allen Furnas	Seth W. Pearson ‡Joseph Gilbert	J. S. Dunlop.
1868	I. D. G. Nelson	*Allen Furnas	Seth W. Pearson ‡Joseph Gilbert	*J. S. Dunlop.
1869	*I. D. G. Nelson	S. Burnett	T. A. Bland ‡W. H. Ragan	Charles Lowder.
1870	Allen Furnas	J. C. Ratliff	Seth W. Pearson ‡W. H. Ragan	Charles Lowder.
1871	Allen Furnas	J. C. Ratliff	W. H. Ragan	Charles Lowder.
1872	J. C. Ratliff	I. S. Jessup	W. H. Ragan	Charles Lowder.
1873	J. C. Ratliff	I. S. Jessup	J. G. Kingsbury	Charles Lowder.
1874	J. C. Ratliff	*I. S. Jessup	W. H. Ragan	Charles Lowder.
1875	Joseph Gilbert	J. A. Mendenhall	W. H. Ragan	Charles Lowder.
1876	Joseph Gilbert	*J. A. Mendenhall	W. H. Ragan	Charles Lowder.
1877	Sylvester Johnson	J. M. Bulla	W. H. Ragan	Daniel Cox.
1878	Sylvester Johnson	J. M. Bulla	W. H. Ragan	Daniel Cox.
1879	Sylvester Johnson	*J. M. Bulla	W. H. Ragan	Daniel Cox.
1880	Sylvester Johnson	S. Burnett	W. H. Ragan	Daniel Cox.
1881	Sylvester Johnson	*S. Burnett	W. H. Ragan	Daniel Cox.
1882	Sylvester Johnson	J. B. Elliott	W. H. Ragan	Daniel Cox.
1883	Sylvester Johnson	C. M. Hobbs	‖W. H. Ragan †C. M. Hobbs	Daniel Cox.
1884	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1885	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1886	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1887	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1888	Allen Furnas	W. A. Workman	C. M. Hobbs	Daniel Cox.
1889	*Allen Furnas	J. C. Stevens	C. M. Hobbs	Daniel Cox.
1890	J. C. Ratliff	Joe A. Burton	C. M. Hobbs	*Daniel Cox. †S. Johnson.
1891	E. J. Howland	Joe A. Burton	W. H. Ragan	W. A. Workman.
1892	E. J. Howland	E. Y. Teas	W. H. Ragan	W. A. Workman.
1893	C. M. Hobbs	E. Y. Teas	W. H. Ragan	W. A. Workman.
1894	C. M. Hobbs	E. Y. Teas	W. H. Ragan	F. Beeler, Sr.
1895	C. M. Hobbs	E. Y. Teas	W. H. Ragan	*F. Beeler, Sr.
1896	C. M. Hobbs	E. Y. Teas	Jas. Troop	Isham Sedgwick.
1897	C. M. Hobbs	E. Y. Teas	Jas. Troop	Isham Sedgwick.
1898	C. M. Hobbs	E. Y. Teas	Jas. Troop	Sylv. Johnson.
1899	C. M. Hobbs	E. Y. Teas	Jas. Troop	Sylv. Johnson.
1900	C. M. Hobbs	Mrs W. W. Stevens	Jas. Troop	Sylv. Johnson.
1901	C. M. Hobbs	Mrs. W. W. Stevens	Jas. Troop	Sylv. Johnson.

* Deceased. † Appointed to vacancy. ‡ Corresponding Secretary. ‖ Resigned.

Digitized by Google

CONSTITUTION AND BY-LAWS

OF THE

Indiana Horticultural Society.

CONSTITUTION.

Article I. This organization shall be known as the Indiana Horticultural Society.

Article II. The objects of the Society are to develop facts and promulgate information pertaining to the science and art of horticulture.

Article III. Its officers shall consist of a President, four Vice-Presidents, Secretary, Treasurer and Executive Committee of three.

Article IV. Its members shall consist of annual members, paying a fee of one dollar per annum into the treasury of the Society, and honorary members, who shall be elected by the Society for merit as horticulturists of distinction, who may, at pleasure, participate in the deliberations of the Society. Members' wives will be members without fee.

Article V. Each member shall be entitled to a copy of the transactions of the Society as often as the same shall be published.

Article VI. The Treasurer shall not disburse money except on the order of the Secretary, countersigned by the President.

Article VII. The Executive Committee shall require of the Treasurer such security as may be deemed sufficient for the safe keeping of the funds of the Society.

Article VIII. The seal of the Society shall consist of an outer rim, embracing the inscription, "Indiana Horticultural Society;" within this, and above the central figure, consisting of a vase of flowers, a pear and apple resting upon a section of vine with its fruit, the words, "Organized 1860;" below, "Incorporated 1875."

Digitized by Google

BY-LAWS.

I. The President shall preside at all meetings of the Society; he, together with the Secretary, shall have power to call meetings of the Executive Committee; he shall present to the Society in his annual address such suggestions and recommendations as may seem appropriate, and shall appoint all special committees unless otherwise directed by the Society.

II. The Vice-Presidents shall be designated as 1st, 2d, 3d and 4th, one of whom, in the order named, shall preside in the absence of the President, and each shall be elected to represent his respective district, said districts to be determined by an apportionment to be made by the Society to be known as the Southern, the South-Central, the North-Central and the Northern districts. Each Vice-President shall make annual reports to the Society, embracing such suggestions and recommendations as may to him seem best for the promotion of the horticultural interests of said district, and he shall give such attention to the organization and building up of local societies in his district as may be within his power.

III. The Secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the Society; establish and maintain correspondence with all local, county, district and State horticultural societies, and secure by exchange their transactions, as far as possible, to aid the President, as an executive officer, in the dispatch of business relating to the meetings of the Society, preparing and publishing circulars and notice of horticultural and similar meetings of general interest, and report to the annual meeting of the Society an abstract of the matter that has come into his possession, which, with its approval, shall become part of the transactions for the current year. He shall also act as librarian of the Society, and shall have the care and custody of its room and its property, under such regulations as may be adopted for the government thereof.

IV. The Treasurer shall receive and hold all funds of the Society, paying out the same only as prescribed by the Constitution. Before entering upon his duties he shall give bond to the Society in the sum of two thousand dollars ($2,000) for the faithful performance of such duties.

Digitized by Google

V. The officers shall be elected annually, by a ballot vote, and shall serve until their successors are elected and qualified.

VI. The objects of the Society being to collect, condense and collate information relative to varieties of fruits and other horticultural products, and dispense the same among the people of the State, every member shall pay into the treasury one dollar a year for the purpose of publishing and other expenses: Provided, That the members of local horticultural societies may become members by paying into the treasury, through their respective local organzations, the sum of fifty cents each. Any person interested in horticulture may become a member by forwarding to the Treasurer or Secretary the fee of membership.

VII. The President, Secretary and Executive Committee may call a meeting of the Society at any time and place they may consider advisable by a notice of thirty days in the public press, or by circulars properly distributed.

VIII. This Society shall hold an annual meeting* on the first Wednesday after the first Monday in January of each year, and at such place as the Society shall designate at its previous meeting, and semi-annual and called meetings may be held as provided for in the preceding section.

IX. The officers of this Society shall constitute a Board of Horticulture, five of whom shall be a quorum for the transaction of business, the officers of the Society to be officers of the Board, said Board to meet immediately on the adjournment of the Society, and afterward on its own adjournment. It shall be the duty of the Board of Horticulture to investigate all accounts or claims against the Society, when presented for payment; to collect horticultural information, for which it may employ an agent, or agents, to visit different portions of this or adjoining States, and may draw on the treasury for money to pay the necessary expenses, when there is money in the treasury not otherwise needed, and said Board shall make full and definite report of its proceedings to the next regular meeting of the Society.

X. These by-laws may be amended and otherwise changed at any regular meeting of the Society by a majority vote.

XI. The following named counties shall constitute the several Vice-Presidents' districts: The Southern District shall include the counties of Crawford, Clark, Dubois, Floyd, Gibson, Harrison, Jefferson, Ohio, Orange, Perry, Pike, Posey, Scott, Spencer, Switzerland, Vanderburgh, Warrick

* The Executive Committee was instructed to fix the date of the meeting for 1901.

Digitized by Google

and Washington. The South-Central District shall include the counties of Bartholomew, Brown, Clay, Daviess, Dearborn, Decatur Fayette, Franklin, Greene, Jackson, Jennings, Johnson, Knox, Lawrence, Martin, Monroe, Morgan, Owen, Ripley, Rush, Shelby, Sullivan, Union and Vigo. The North-Central District shall include the counties of Benton, Blackford, Boone, Cass, Carroll, Clinton, Delaware, Fountain, Grant, Hamilton, Hancock, Hendricks, Henry, Howard, Jay, Madison, Marion, Montgomery, Parke, Putnam, Randolph, Tippecanoe, Tipton, Vermillion, Warren and Wayne. And the Northern District shall include the counties of Adams, Allen, Dekalb, Elkhart, Fulton, Huntington, Jasper, Kosciusko, Lagrange, Lake, Laporte, Marshall, Miami, Newton, Noble, Porter, Pulaski, Starke, Steuben, St. Joseph, Wabash, Wells, White and Whitley.

Digitized by Google

LIST OF MEMBERS

OF THE

Indiana Horticultural Society

FOR 1899-1900.

LIFE MEMBERS.

Name.	*Postoffice.*	*County.*
Burton, Joe A	Orleans	Orange.
Butler, Prof. A. W	Indianapolis	Marion.
Fletcher, Calvin	Indianapolis	Marion.
Conley, John	Richmond	Wayne.
Cowing, Granville	Muncie	Delaware.
Hobbs, C. M	Bridgeport	Marion.
Kane, Morgan	Mitchell	Lawrence.
Morris, Thomas B	Richmond	Wayne.
Ragan, W. H	Greencastle	Putnam.
Ratliff, Joseph C	Richmond	Wayne.
Shanklin, A. T	Cutler	Carroll.
Teas, E. Y	Green's Fork	Wayne.
Woods, Arthur Earle	Pecksburg	Putnam.

HONORARY MEMBERS.

Name.	*Postoffice.*	*County.*
Bailey, Dr. L. H	Ithaca, N. Y.	
Bennett, Mrs. Emeline	New Amsterdam	Harrison.
Burrill, Prof. T. J	Champaign, Ill.	
Farnsworth, W. W	Waterville, Ohio.	
Garfield, Charles W	Grand Rapids, Mich.	
Green, Prof. W. J	Wooster, Ohio.	
Hale, J. H	South Glastonbury, Conn.	
Morrill, R	Benton Harbor, Mich.	
Ohmer, N	Dayton, Ohio.	
Quick, Prof. Walter J	Brooklyn	Morgan.

Digitized by Google

Name.	*Postoffice.*	*County.*
Sanders, Edgar	Chicago, Ill.	
Stanton, J. W	Richview, Ill.	
Van Deman, H. E	Parksley, Va.	
Taft, Prof. L. R	Agr'l College, Mich.	
Willard, S. D	Geneva, N. Y.	
Craig, Prof. John	Ithaca, N. Y.	
Dunlap, H. M	Savoy, Ill.	
Dunlap, Mrs. H. M	Savoy, Ill.	
Lazenby, Prof. W. R	Columbus, Ohio.	

ANNUAL MEMBERS.

Name.	*Postoffice.*	*County.*
Albertson, Emory	Bridgeport	Marion.
Albertson, Mrs. E	Bridgeport	Marion.
Anderson, O. C	Mentone	Kosciusko.
Anderson, E. D	Mentone	Kosciusko.
Andrews, Wm	Valentine	LaGrange.
Andrews, Mrs. Wm	Valentine	LaGrange.
Apple, J. W	Oaklandon	Marion.
Apple, Mrs. J. W	Oaklandon	Marion.
Applegate, J. A	Mt. Carmel	Franklin.
Arnold, W. H	Danville	Hendricks.
Arnold, Mrs. W. H	Danville	Hendricks.
Baldwin, Asa T	Marion	Grant.
Baldwin, Mrs. Asa T	Marion	Grant.
Baldwin, T. A	Oxford	Benton.
Baldwin, Mrs. T. A	Oxford	Benton.
Barr, R. J	Washington	Daviess.
Barr, Mrs. R. J	Washington	Daviess.
Beard, Jonathan	Edwardsville	Floyd.
Beard, Mrs. Jonathan	Edwardsville	Floyd.
Beeler, Fielding	Indianapolis	Marion.
Berryman, W. L	Tipton	Tipton.
Berryman, Mrs. W. L	Tipton	Tipton.
Beuoy, Ran	Matthews	Grant.
Beuoy, Mrs. Ran	Matthews	Grant.
Billingsley, J. J. W	Indianapolis	Marion.
Billingsley, Mrs. J. J. W	Indianapolis	Marion.
Biliter, Ben F	Huntington	Huntington.
Biliter, Mrs. Ben F	Huntington	Huntington.
Bird, John	Raysville	Henry.
Bird, Mrs. John	Raysville	Henry.
Bowman, Jonas	Wolf Lake	Noble.
Bowman, Mrs. Jonas	Wolf Lake	Noble.
Bradley, C. P	South Bend	St. Joseph.
Brown, J. P	Connersville	Fayette.
Brudi, Joseph, Jr	New Haven	Allen.
Buker, F. M	Rome City	Noble.

Digitized by Google

Name.	*Postoffice.*	*County.*
Buker, Mrs. F. M.	Rome City	Noble.
Bullock, L. O.	LaGrange, R. R. No. 1	LaGrange.
Bullock, Mrs. L. O.	LaGrange, R. R. No. 1	LaGrange.
Burket, Elmore	Markle	Huntington.
Burris, J. B.	Cloverdale	Putnam.
Burris, Mrs. J. B.	Cloverdale	Putnam.
Campbell, G. N	Hanfield	Grant.
Campbell, Mrs. G. N.	Hanfield	Grant.
Campbell, George P.	Bloomington	Monroe.
Campbell, Mrs. George P.	Bloomington	Monroe.
Case, Riley C.	LaGrange, R. R. No. 1	LaGrange.
Case, Mrs. Riley C	LaGrange, R. R. No. 1	LaGrange.
Chamberlin, R. H	Bloomington	Monroe.
Chamberlin, Mrs. R. H.	Bloomington	Monroe.
Clore, J. R.	Jamestown	Boone.
Cobbs, H. G.	Rome City	Noble.
Cobbs, Mrs. H. G.	Rome City	Noble.
Coburn, John	Indianapolis	Marion.
Coburn, Mrs John	Indianapolis	Marion.
Coffeen, T. J	South Bend	St. Joseph.
Cole, B. F	Trafalgar	Johnson.
Cole, Mrs. B. F.	Trafalgar	Johnson.
Cox, Jesse	Westfield	Hamilton.
Cox, S. M.	Westfield	Hamilton.
Creel, L. D.	Angola	Steuben.
Creel, Mrs. L. D.	Angola	Steuben.
Crawford, John	Rob Roy	Fountain.
Crawford, Matthew	Cuyahoga Falls, Ohio.	
Custer, L. B	Logansport	Cass.
Custer, Mrs. L. B.	Logansport	Cass.
Daubenspeck, J. W	Mattsville	Hamilton.
Davis, Mrs. B. A.	Laporte, R. R. No. 1	Laporte.
Davis, E. B	Cartersburg	Hendricks.
Davis, Mrs. E. B.	Cartersburg	Hendricks.
Deal, L. E.	Plato	Lagrange.
Deal, Mrs. L. E	Plato	Lagrange.
DeLong, Dan	Frankfort	Clinton.
Demaree, J. Y.	Bud	Johnson.
Demaree, Mrs. J. Y.	Bud	Johnson.
DeVilbiss, W. F	Fort Wayne	Allen.
DeVilbiss, Mrs. W. F.	Fort Wayne	Allen.
DeVilbiss, Miss L. A.	Fort Wayne	Allen.
Dickenson, Rev. F. E.	Kendallville	Noble.
Dickenson, Mrs. F. E.	Kendallville	Noble.
Dinsmore, Joe	Bloomington	Monroe.
Dodds, Mrs. C. F	Bloomington	Monroe.
Dorner, Fred, Sr	Lafayette	Tippecanoe.
Dorner, Mrs. Fred, Sr.	Lafayette	Tippecanoe.

Digitized by Google

Name.	*Postoffice.*	*County.*
Dorner, Fred, Jr	Lafayette	Tippecanoe.
Dorner, Mrs. Fred, Jr.	Lafayette	Tippecanoe.
Dreyer, F. J.	Frankfort	Clinton.
Eickhoff, Ed. A	Gallaudet	Marion.
Eickhoff, Mrs. Ed. A	Gallaudet	Marion.
Eshelman, Levi	Walcottville	Lagrange.
Eshelman, Mrs. Levi	Walcottville	Lagrange.
Ellison, R	Lagrange	Lagrange.
Ellison, Mrs. R.	Lagrange	Lagrange.
Emerson, Clarence V	Owensville	Gibson.
Fess, Fred	Bloomington	Monroe.
Fess, Mrs. Fred	Bloomington	Monroe.
Febles, Geo	Albion	Noble.
Febles, Mrs. Geo.	Albion	Noble.
Flanner, Frank W	Indianapolis (4020 North Meridian St.)	Marion.
Flanner, Mrs. Frank W	Indianapolis	Marion.
Flick, W. B	Lawrence	Marion.
Flick, Mrs. W. B.	Lawrence	Marion.
Fowler, J. A	Pendleton	Madison.
Frame, J. R.	South Bend.	St. Joseph.
Frame, Mrs. J. R.	South Bend	St. Joseph.
Fry, W. H.	Franklin	Johnson.
Fry, Mrs. W. H	Franklin	Johnson.
Furnas, T. C.	Sheridan	Hamilton.
Furnas, Mrs. T. C.	Sheridan	Hamilton.
Garretson, Davis	Pendleton	Madison.
Garretson, Harvey	Pendleton	Madison.
Garretson, Amos	Pendleton	Madison.
Garretson, Mrs. Amos	Pendleton	Madison.
Garretson, C. A	Pendleton	Madison.
Gillette, J. J	Lagrange	Lagrange.
Gillette, Mrs. J. J	Lagrange	Lagrange.
Goble, D. H.	Greenfield	Hancock.
Goble, Mrs. D. H.	Greenfield	Hancock.
Good, M. J.	Avilla	Noble.
Good, Mrs. M. J.	Avilla	Noble.
Graham, A. A.	Liberty	Union.
Graves, V. C	Richmond	Wayne.
Graves, Hannah	Richmond	Wayne.
Grossman, J. C.	Wolcottville	Lagrange.
Gustin, E. R.	Peru	Miami.
Hadley, Mrs. Addison	Hadley	Hendricks.
Hale, H. J	Indianapolis	Marion.
Hale, Mrs. H. J	Indianapolis	Marion.
Halstead, Wm.	Rensselaer	Jasper.
Hanger, M. V.	Edwardsville	Floyd.
Haines, John	Pendleton	Madison.

Digitized by Google

Name.	*Postoffice.*	*County.*
Haines, Noah	Pendleton	Madison.
Haines, Mrs. Noah	Pendleton	Madison.
Hardy, Thos. M	Pendleton	Madison.
Hardy, Mrs. Thos. M	Pendleton	Madison.
Harvey, L. W	Albion, R. R. No. 1	Noble.
Harvey, Mrs. L. W	Albion, R. R. No. 1	Noble.
Henby, J. K.	Greenfield	Hancock.
Henby, Mrs. J. K	Greenfield	Hancock.
Henley, Reuben B	Carthage	Rush.
Henney, A. N	Wolcottville	Lagrange.
Henney, Mrs. A. N.	Wolcottville	Lagrange.
Henry, H. W	Laporte	Laporte.
Henry, Mrs. H. W	Laporte	Laporte.
Higgens, J. T	Meltzer	Shelby.
Higgens, Mrs. J. T	Meltzer	Shelby.
Hitchcock, Don K	Brimfield	Noble.
Hitchcock, Mrs. Don K.	Brimfield	Noble.
Hobbs, E. M. C	Salem	Washington.
Hobbs, Mrs. E. M. C	Salem	Washington.
Hoffman, D. H.	Winchester	Randolph.
Hoover, John	Spiceland	Henry.
Hoover, Mrs. John	Spiceland	Henry.
Howland, C. A.	Howland	Marion.
Howland, Mrs. C. A	Howland	Marion.
Howland, E. J.	Howland	Marion.
Howland, Mrs. E. J	Howland	Marion.
Husselman, Cal	Auburn	Dekalb.
Husselman, Mrs. Cal	Auburn	Dekalb.
Jackson, W. C	Lagrange	Lagrange.
Jackson, Mrs. W. C	Lagrange	Lagrange.
Jacobs, Chas	Pendleton	Madison.
Jacobs, Mrs. Chas	Pendleton	Madison.
Jessup, Fred	Baker's Corner	
Jester, L. N	Colburn	Tippecanoe.
Jester, Mrs. L. N.	Colburn	Tippecanoe.
Johnson, Sylvester	Irvington	Marion.
Jones, Isaac B	Pendleton	Madison.
Johnson, D. B	Mooresville	Morgan.
Johnson, Mrs. D. B.	Mooresville	Morgan.
Kegerreis, J. C.	Red Key	Jay.
Kelsey, M	Dumfel	Whitley.
Kimmell, J. C	Ligonier	Noble.
Kimmell, Mrs. J. C	Ligonier	Noble.
Kingsbury, J. G	Irvington	Marion.
Kingsbury, Mrs. J. G.	Irvington	Marion.
Kinnard, J. D	Pendleton	Madison.
Kirby, Ben	Bloomington	Monroe.
Kirby, Mrs. Ben	Bloomington	Monroe.
Knaub, Ben	North Vernon	Jennings.
Knaub, Mrs. Ben	North Vernon	Jennings.

Digitized by Google

Name.	*Postoffice.*	*County.*
Lafuse, W. H.	Liberty	Union.
Lafuse, Mrs. W. H.	Liberty	Union.
Latta, Prof. W. C.	Lafayette	Tippecanoe.
Latta, Mrs. W. C.	Lafayette	Tippecanoe.
Leaming, Henry	Romney	Tippecanoe.
Leaming, Mrs. Henry	Romney	Tippecanoe.
Leaming, G. C	Romney	Tippecanoe.
Leaming, Mrs. G. C.	Romney	Tippecanoe.
Leighty, J. R	Rawlins, Wyo.	
Leityman, W. F	Mooresville	Morgan.
Library Ohio State University	Columbus, Ohio.	
Library of Pomology	Washington, D. C.	
Little, James	Cartersburg	Hendricks.
Little, Mrs. James	Cartersburg	Hendricks.
Lone, Marshall	Crandall	Harrison.
Lord, J. Erwin	Pompanoosac, Vt.	
Louth, C.	Battle Ground	Tippecanoe.
Lowth, Chas.	Lagrange, R. R. No. 1	Lagrange.
Lowth, Mrs. Chas.	Lagrange, R. R. No. 1	Lagrange.
Maish, D. F	Frankfort	Clinton.
Maish, Mrs. D. F.	Frankfort	Clinton.
Martin, John P.	Logansport	Cass.
McCalister, A. W.	Pendleton	Madison.
McClue, Charles	Angola	Steuben.
McClue, Mrs. C	Angola	Steuben.
McDougal, D. T.	Bronx Park, N. Y.	
McMahan, H. F.	Fairfield	Franklin.
McMahan, Mrs. H. F.	Fairfield	Franklin.
McIntosh, G. W.	Rego	Orange.
McIntosh, Mrs. G. W.	Rego	Orange.
McMillan, James H	Logansport	Cass.
McMillan, Mrs. James H	Logansport	Cass.
McMillan, John K.	Bridgeport	Marion.
Millhouse, J. J	Valley Mills	Marion.
Miller, O. H	Covington	Fountain.
Miller, D. B	Pimento	Vigo.
Mills, J. W.	Lagrange, R. R. No. 1	Lagrange.
Mills, Mrs. J. W.	Lagrange, R. R. No. 1	Lagrange.
Moore, Dr. Henry	Irvington	Marion.
Morehouse, John W.	Albion	Noble.
Morehouse, Mrs. J. W	Albion	Noble.
Moyer, G. N	Laketon	Wabash.
Moyer, Mrs. G. N	Laketon	Wabash.
Murray, Dr. R. D	Mobile, Ala.	
Mustard, Wm.	Broad Ripple	Marion.
Mustard, Mrs. Wm.	Broad Ripple	Marion.
Neal, Mrs. Isabel	Albion	Noble.
Newby, Thomas T	Carthage	Rush.
Newby, Mrs. Thomas T.	Carthage	Rush.

Digitized by Google

Name.	*Postoffice.*	*County.*
Newman, R. H.	Lagrange, R. R. No. 3	Lagrange.
Newman, Mrs. R. H	Lagrange, R. R. No. 3	Lagrange.
Newton, George F	South Bend	St. Joseph.
Newton, Mrs. George F	South Bend	St. Joseph.
Noe, L. J	Winamac	Pulaski.
Noe, Mrs. L. J.	Winamac	Pulaski.
Parker, Frank	Wolcottville	Lagrange.
Parsons, A. A	Plainfield	Hendricks.
Parsons, Mrs. A. A.	Plainfield	Hendricks.
Perry, Alex	McCutcheonville	Vanderburgh.
Peterson, Henry C.	Albion	Noble.
Peterson, Mrs. Henry C.	Albion	Noble.
Pierce, Frank	Lafayette	Tippecanoe.
Phelps, W. W	Noblesville	Hamilton.
Public Free Library	St. Louis, Mo.	
Ragan, Miss Belle	Greencastle	Putnam.
Ragan, J. W.	Fillmore	Putnam.
Ragan, Mrs. J. W	Fillmore	Putnam.
Ratliff, Walter S.	Richmond	Wayne.
Ratliff, Mrs. Walter S	Richmond	Wayne.
Rea, J. C	Harrisburg	Fayette.
Reeve, J. D	Byron	Parke.
Reed, W. C	Vincennes	Knox.
Rich, J. C.	Richmond	Wayne.
Rich, Mrs. J. C.	Richmond	Wayne.
Ridgeway, M. H	Wabash	Wabash.
Ridgeway, Mrs. M. H	Wabash	Wabash.
Ritterskamp, Will J	Princeton	Gibson.
Ritterskamp, Mrs. W. J	Princeton	Gibson.
Roberts, Edward	Pendleton	Madison.
Roberts, Mrs. Edward	Pendleton	Madison.
Robinson, Norman	Southern Pines, N. C.	
Robison, E. A	Rocklane	Johnson.
Rockhill, D. K.	South Bend	St. Joseph.
Rockhill, Mrs. D. K	South Bend	St. Joseph.
Ross, R. L.	Pendleton	Madison.
Royer, E. E	Woodruff	Lagrange.
Royer, Mrs. E. E	Woodruff	Lagrange.
Royer, Charles S.	Valentine	Lagrange.
Royer, Mrs. C. S	Valentine	Lagrange.
Ruhl, Benj.	Lima	Lagrange.
Ruhl, Mrs. Benj	Lima	Lagrange.
Sams, Sylvester	Albion	Noble.
Sams, Mrs. Sylvester	Albion	Noble.
Sanders, Riley	Bloomington	Monroe.
Scholl, Jonas	Lyons Station	Fayette.
Sedgwick, Isham	Richmond	Wayne.
Sedgwick, Mrs. Isham	Richmond	Wayne.

Digitized by Google

Name.	*Postoffice.*	*County.*
Shirer, Joseph	Flora	Carroll.
Shoemaker, A. W.	Daleville	Delaware.
Shoemaker, Mrs. A. W.	Daleville	Delaware.
Slater, N. W.	Marshfield	Warren.
Slater, Mrs. N. W	Marshfield	Warren.
Simpson, H. D.	Vincennes	Knox.
Smith, John A	Milroy	Rush.
Smith, Mrs. John A	Milroy	Rush.
Smith, James	Richmond	Wayne.
Smith, Robert L	Marion	Grant.
Smith, Mrs. Robert L	Marion	Grant.
Snyder, E. E	Wolcottville	Lagrange.
Snyder, Mrs. E. E	Wolcottville	Lagrange.
State Librarian	Indianapolis	Marion.
State Librarian	Concord, N. H.	
Stevens, Jesse C	Centreville	Wayne.
Stevens, Mrs. Jesse C	Centreville	Wayne.
Stevens, W. W	Salem	Washington.
Stevens, Mrs. W. W	Salem	Washington.
Stineman, Jonas	Wawpacong	Miami.
Stineman, Mrs. Jonas	Wawpacong	Miami.
Stinger, B. F	Charlottsville	Hancock.
Stinger, Mrs. B. F	Charlottsville	Hancock.
Stockberger, J. J	Ligonier	Noble.
Stout, Wilbur C	Monrovia	Morgan.
Stout, Mrs. Wilbur C	Monrovia	Morgan.
Stuart, Wm	Lafayette	Tippecanoe.
Stuart, Mrs. Wm.	Lafayette	Tippecanoe.
Swaim, H. H	South Bend	St. Joseph.
Swaim, Mrs. H. H	South Bend	St. Joseph.
Swain, W. A.	Pendleton	Madison.
Swift, Evan	Franklin	Johnson.
Talbert, Rev. Wm	Albion	Noble.
Talbert, Mrs. Wm	Albion	Noble.
Thomas, Sylvanus	Marion	Grant.
Thomas, Mrs. Sylvanus	Marion	Grant.
Thomas, J. L.	Pendleton	Madison.
Thomas, Mrs. J. L.	Pendleton	Madison.
Thomas, W. D.	Connersville, R. R. No. 1.	Fayette.
Thomas, Mrs. W. D.	Connersville, R. R. No. 1.	Fayette.
Thomas, Snead	Marion	Grant.
Thomas, John Q	Marion	Grant.
Thomas, Mrs. John Q.	Marion	Grant.
Thorpe, E. R	Washington	Daviess.
Tilson, John	Franklin	Johnson.
Tilson, Mrs. John	Franklin	Johnson.
Troop, Prof. J.	Lafayette	Tippecanoe.
Troop, Mrs. J	Lafayette	Tippecanoe.
Tufts, Elmer G	Aurora	Dearborn.
Tufts, Mrs. E. G	Aurora	Dearborn.

Digitized by Google

Name.	*Postoffice.*	*County.*
Walker, Ernest	Fayetteville, Ark.	
Walker, Mrs. Ernest	Fayetteville, Ark.	
Williams, S. T. S	Knightstown	Henry.
Williams, Mrs. S. T. S	Knightstown	Henry.
Williams, W. A	Rome City	Noble.
Williams, Mrs. W. A	Rome City	Noble.
Willcutts, W. E	Roesburg	Grant.
Widney, H. M	St. Joe Station	Dekalb.
Widney, Mrs. H. M	St. Joe Station	Dekalb.
Woods, N. E	Pecksburg	Hendricks.
Woods, Mrs. N. E	Pecksburg	Hendricks.
Wood, E. M	North Madison	Jefferson.
Wood, Mrs. E. M	North Madison	Jefferson.
Wood, A. C	Pendleton	Madison.
Young, W. A	Franklin	Johnson.

Digitized by Google

Digitized by Google

PROCEEDINGS

OF THE

Indiana Horticultural Society.

MIDSUMMER MEETING AT PLAINFIELD,
AUGUST 16 AND 17,

1900.

The summer meeting of the Indiana Horticultural Society was held at Plainfield on Thursday and Friday, August 16 and 17, 1900.

The meeting was opened at 10 a. m., with prayer by Rev. David Hadley. The address of welcome was delivered by Hon. James M. Barlow, of Plainfield, who said:

Mr. Chairman and Visitors—I welcome you this morning into the county of Hendricks—one we believe, of the very best counties in the great State of Indiana. Situated as we are, in the central part of the State, near the metropolis, traversed with good watercourses, diversified by our undulating lands, we have soils adapted to all grains, vegetables and fruits that do well in this climate. The county of Hendricks, or such part of it as we now occupy, is one known for many years as a fertile, productive part of the county. It has been said that in the early settlement of Indiana, particularly by the Quakers, whose hospitality we now enjoy, that that class of citizenship has been equal to and perhaps greater in the production of all the fruits and vegetables than any other in the community. It was Dr. Furness, of this county, who once had a nursery here that was known far and wide for the honesty of the stock he put on the market and shipped to different points. We had before that the Sickeron nursery, possibly seventy years ago, located four and one-

Digitized by Google

half or five miles north of here. Trees from that nursery still stand. When I was a small boy, I remember fruit that grew from those trees. There is no question that they were far superior to what we now raise, possibly on account of the newness of the country and less pests and insects and other disturbances to fruit growth. We had other nurseries that also had wide reputations. We have another nursery in the western part of the county which has put out a good many trees, and at present your President is known throughout all the great States of our Nation where fruits will grow well. Hence we feel that when we meet you we greet you as friends. You who are here to-day have left your homes and with you have brought telling evidences, indisputable, that your work is the business of horticulture. That speaks more than tongue can speak. That is the real thing, hence you are not strangers in Hendricks County. Hendricks County has been noted for her good stock. A number of men here are known far and wide for bringing fine stock to market. The horse, cattle, hog and sheep interests have not been left alone. It was looked after and well looked after by the people of this county. Our churches have been well cared for. The little log church has given way to large brick mansions. The little dirt-floored schoolhouse has given way to others which are among the finest in the State. All of which we are proud of. I say to you in behalf of the citizens of this town and county that I welcome you into our midst, and whatever is ours is yours to enjoy while you remain with us. I thank you for your visit. I am glad to meet you face to face. Some I have seen before and others not. I say again that the town is yours. Make yourselves at home. Remember us when you return home.

Response to Welcome, by Sylvester Johnson, Irvington.

Mr. Chairman—I will say in behalf of the Society that we accept this welcome and kindly greeting in the spirit in which it was intended by the speaker, and had I been a member of the Legislature, as was the one who has just taken his seat, I could probably have expressed the feelings of the Society better, but, never having had this experience, I feel at a loss to undertake to do it justice. But personally I want to say a word or two. There is one thing and only one thing that I would disagree with the speaker on. That is that the fruit now is not as good as when he was a boy. I think I can account for that feeling he exhibits on the ground that he was a boy then and his appetite is not so strong now as then. I have received great good from this Society, and I hope we may do this community some good. I know something of this county, and second every word he has said. I have a warm feeling

Digitized by Google

for the people of this county because it is so much like Wayne County, where I spent most of my boyhood. I assure you that the members of this Society feel gratified for your cordial welcome, and I am sure we will feel at home with your citizens, and we hope they will attend our meetings and be benefited by us. We think we who have been in this work for so many years can be of benefit to those who have not lived so long as we have. In the meantime we ask the citizens to participate in our discussions, and we want to do you all the good we can, and we want you to do us what good you want to do.

The first paper was then read:

HORTICULTURE—ITS RELATION TO THE COUNTRY HOMES.

BY ADRIAN A. PARSONS, PLAINFIELD.

When I was informed that I had been assigned a subject, and was expected to prepare a paper for the State Horticultural Society meeting, the first thought that came to me was, What does the committee expect of me? The answer was worked out to my satisfaction by recalling a visit one of the committee made to our place a few weeks before. He found us down in a small field not far from the house planting beans, with a hoe, just an ordinary hoe, and the old-fashioned white army bean.

The girl I left behind me was dropping and I did the covering—and, by the way, that being left behind was a long time ago, and is all I have to boast of, never having been able to repeat it. I was also at work on a problem. You see I thought I knew more than Professors Henry, Latta and all the rest that didn't agree with me, and had tried to get four weeks more into the season by tacking them on the front end. I had planted what they believed a tender plant too soon.

My pride was assuming Chinese proportions after the first frost, which did no harm at all, but in ten days another came, with the union brand, that got in its work in fine shape. We were filling up the vacancies with beans, and the problem was, why should three or four be taken and one left?

I was very near a solution when some one called, "Hello! What's this?" Looking up, I saw him holding a plant in his hand. I gave him the name I knew it by. "Yes," says he, "a forage plant. And what's this?" "That," I said, " is another forage plant we call rape." "Rape?" he said, and began pulling the leaves and filling his mouth with them. And from force of habit I took some prepared fodder from my pocket, filled my mouth, and almost immediately we were as congenial as brothers.

Digitized by Google

He said: "Aren't you lonesome? You're half a mile back from the road, and have no free mail delivery, and no telephone."

I told him we were not lonesome, only sometimes when we had company, and by being back from the road the temptation was removed by that distance to meddle with other people's business, and we didn't want a telephone because just now talk is the cheapest thing on the market. I have given enough of the conversation to show why I was put on for a paper.

The committee wanted something from away back. But I will not attempt a logical discussion of the subject assigned, because I am desirous of keeping the reputation I have been so long in making—that is, not to undertake anything when the chances of success are all against me.

The people that live in the country may be properly divided into three classes: The agriculturist, the horticulturist, and the farmer.

It appears from authentic history that horticulture is the oldest institution, but had a very severe setback that kept it in the background for a few thousand years. To explain all that led to this would take too much of our time, but it is generally believed that the woman had much to do with it. I don't agree with all of this theory, but if she did she should have the full measure of honor due her for restoring it.

It appears from the same history that Tubal Cain gave the first great impulse to agriculture by making the first plowshare. This satisfied the people, and for thousands of years the son carefully followed in the footsteps of the grandfather. Under this system food was obtained, strong constitutions and muscular bodies were built up, but little mental effort was required. Nature's full storehouse compensated and balanced the condition. But as time and a continual draft had diminished these accumulated stores, a greater effort was necessary on the part of the laborer to produce the same results; this effort also added a quickening germ to the mind, and more thought began to be mixed with the labor, and the garden was almost invariably the first thing to feel the touch of inspiration. Here the woman comes in and regains all her lost prestige, for that was for centuries her unquestioned domain, the husband seldom sharpening the hoe with which the work was done.

From the better cultivated gardens grew forms of beauty that permeated the home and furnished a greater stimulus to mental activity. This, like added pinions, was constantly presenting new views, which, being materialized, bound the thoughts more closely to the home and built up and strengthened the desire for the ideal. This creative power that thought controls and is especially the heritage of the ruralist.

The greatest satisfaction in life is to be filled with love, and the strongest and best love is the outgrowth of labor.

Digitized by Google

The ruralist is nearest the divine heart because he is nearest a co-worker, and can say more truthfully that the results of his labor are very good. He earns his rest, and in the contemplation of the beauty he has created lies his greatest reward.

To make the thought more clear, contrast the rural home with the city. The city home is a beautiful picture, bought with money. The aspirations to get more money to buy more pleasure. The result, a hungering after that deep love that a knowledge of having employed the talents given to the accomplishment of the greatest good possible, in harmony with nature and nature's God, always brings.

The rural home is materialized labor and thought, which is a touch of divinity. The aspirations, to think deeper and strive harder to get closer to nature's heart, to revel in her secrets. The results, a feeling of kinship to everything. Having watched the growth and development of every form of beauty that surrounds him, they are the children of his love and care.

All the thought and labor that has brought him to this point has developed him into a farmer. The idea conveyed by the word agriculture is cultivating the fields, and of horticulture the gardens and orchards. But the farmer has combined all the economies of nature, and is working them in harmony, each contributing to the support of the other.

As nature's laws are sometimes varied by a sport—that is, something appears without seeming to have followed the rule that like begets like—so among farmers we have an occasional specimen that seems to confine all his energies in one direction, the development or production of a single article. We call them specialists, and the greatest results in producing individual specimens of high merit are obtained by this concentration of all the faculties in one line, but few of this class are needed, and it appears as a wise provision that nearly all specialists are bachelors.

Duthy, the greatest living shorthorn breeder, is an old bachelor, and says that a man that has great love for stock has no love for women. Their numbers are decreasing. They used to be common among the old agriculturists who did just as father did and compelled the son to do likewise. The cause has suffered great loss by having the brightest boys driven from the farm by the ignorance of the father. Men who have never been able to grow two ears of corn exactly alike have thought to change the individuality of the child and shape a course for him. The fathers are working under a stronger light now, and those mistakes of the past are not likely to be repeated.

The power of the Nation is cradled in rural homes, and the nearer they approach the ideal from nature's standpoint the clearer and loftier will be the national thought.

Digitized by Google

DISCUSSION.

Discussion led by Amos Garretson, Pendleton.

Mr. Garretson: Ladies and Gentlemen—I also think that the committee made a mistake in their choice of one to respond to this paper. We started out two weeks ago to attend this meeting and came by the way of Brown County. We also spent a very pleasant day at Bloomington. We find the rural homes are closely related to the divine heart. When we landed in this town the very first person we met was Mr. Morgan, and he turned everything over to us. We made ourselves at home. We think the rural home is THE home. I am a poor man to talk and will only open the subject and let some one else do the discussing.

Mrs. Stevens: Perhaps I am one of the most enthusiastic women horticulturists in the State, and I would like to say a word. I have learned to shrink at the word horticulturist, because almost every time the men refer to Mother Eve, and of course that is a tender spot with part of us. But for those who think as I do, I want to drop this from Elizabeth Cady Stanton. Some one had said to her that woman has never received the penalty she deserved for offering the apple to Adam. She justified her by saying that Satan did not take an apple from a fine tree, but he took it from the tree of knowledge, and she thought Eve was very wise to take it, and was still wiser to offer it to her husband. I want you to feel that we did not do such a bad job after all.

Mr. Barlow: I have been a rather close observer as to horticulture and its relation to country homes, and whether we are doing our duty as parents or not. There has been a great desire among the children throughout our country in the rural districts to get away from the country home and go to town. In our own town we have a number of citizens who have good farms near by, but they have gone to town with the children. If they do not go to stay all the time, they stay part of the time. It is my opinion that the country is not only the healthiest, but much the best place to raise your family. I think much depends upon the manner in which we make our country homes. We are now making them more pleasant. We have more books and papers; we have rural

Digitized by Google

deliveries and we can get our papers every day. It makes home in the country equal to or better than in town. There is not a boy who does not like the taste of fruit from the tree better than from the grocery store. It is better. The melons are better. Pears are better. Grapes are better. Why? Because they are more perfect. Culture of these things is tending to bring the children back to the country. My prediction is that in twenty years from now people in town will want to get to the country, and I believe that the more we try to put such fruit on our farms and let our children understand it is not drudgery, the more they will want to stay there. We do not need to labor so much. We should have more recreation. More time to look after these things. If we make our rural homes more pleasant the children will want to stay there.

Mr. Davis: After hearing the older horticulturists speak, I would like to add a word or two from the younger side. I would like to say that the country home is what the occupants make it. The man is to a great extent what he makes himself. I mean that if he deals in fruits and flowers and the like, he will be a better man. If he is a hog raiser and keeps that work up, he will become more like a hog. I do not mean to say that no stock should be raised, but it is a fact that horticulturists are a better class of people because they are closer to God as they cultivate these things that bring them nearer to God.

In our farmers' institute there was a question: "Which is more profitable, our boys and girls or our stock?" I do not blame men and women for leaving the farm when they see the homes with no flowers, no fruit or anything attractive. Keep them at home by raising good fruit and nice flowers and living close to nature's God.

Mr. Ratliff: There has been a wonderful change in the occupants of the country homes in recent years. In passing through different sections of the country I find that the majority of the farmers are young people. The older people have a right to leave the farm. Their duty has been performed. Their years of activity are past and I think they require some rest, and in doing this their children should take their places. If there is anything conducive to good health and prosperity, it is the country home.

Digitized by Google

I heard a paper not long since in reference to the number of young people that are leaving the farms and going to the city. The reader said that the way to cause young people to leave the farm was to give them an education. They did not know that I had been to an agricultural school. I could not refrain from answering him, and I could state that there was one consolation in a good education, and that was that it is always at hand. One of the professors at Earlham says that no one until he gets to be forty years old should refrain from trying to learn something. If children and young people fail to get an education it is a great detriment. Farmers will soon learn that it is a benefit to secure one for themselves and for their posterity. In passing through the country you will see that the farm homes are being repaired. Now trees are being placed around the homes. Orchards are being planted, and as a result more contentment is being found at home. This should be encouraged.

Mr. D. B. Johnson: I have been thinking of the old home where I was born and reared and of the abundance of fruit we had. That is the first thing I think of when I think of the old farm. It has come back to me of late years and I am trying to reproduce the abundance of fruit, and I believe when we get a home and look over it we place a great deal of value on the horticultural side of the farm. A farm with all this is considered a good home. Children seem to like the farm if the horticultural side is looked after. I think if I should live very long I will be quite a horticulturist.

Mrs. DeVilbiss: If growing hogs would make us like a hog, would growing trees make us like trees? The subject of horticulture elevates and causes contentment in the home, and it also is a good thing to make money out of. When we moved on our farm we were laughed at, and people said if we wanted to raise bricks we would have to fertilize, but we kept on and I think we will raise the golden brick after awhile.

Mr. Henry: If a person will follow the history of the farm for the past thirty or forty years he will see the reason why horticulture has been neglected since 1860. Before that, a person could plant a tree and reap the fruit without much trouble, and our fore-

Digitized by Google

fathers did that. That is the reason we had plenty of fruit. After the war began and people began to look more at the money side, they neglected the horticultural part and they were looking more after dollar wheat and getting money directly out of the soil. They neglected the horticultural side. Perhaps the farmers concluded they could make more money out of the soil and buy their fruit. Perhaps it is a benefit to the farmer as well as to the community that there is not so much money in wheat as there used to be. There are a great many farmers to-day who are planting fruit simply because they have not the money to buy it. Perhaps that is a benefit to the farmer and his family. I think that is the reason why horticulture has been neglected for the last twenty-five years on the farm. I know there is a revival of it to-day. I know there are more farmers engaged in beautifying their homes than there was ten years ago, and I believe it will increase right along.

Mr. Hale: About seventeen years ago, living in the city and having a family growing up, I considered it almost a necessity to go out where I could have better surroundings, so I moved out three miles on the end of a field without a tree or a stump on it. I tried to build a home there, having a good paper, "The Indiana Farmer," to help me, and I succeeded in building quite a nice country home, and I have not been sorry at any time that I have such a place.

Mr. Flanners: I just want to say what is perhaps unnecessary, but I want to put in a little word for a little more beauty about the country home. In a funny paragraph in a paper the other day, some lady, in speaking of a school, spoke of a girl who attended the school by the name of Bridget. At the end of the first year the name had turned into Bridgetta. The second year it was Etta. The third year it was Margaretta, and the fourth year she graduated as a full grown Marguerite. There was something pathetic about it. There was love for the beautiful. In her homely and ignorant way she was trying to develop the beautiful. I once went to the room of a colored woman. She had gathered a few fancy photographs and had added some small theatrical posters and then gathered advertisements from the grocery, and then she took off the papers from fruit cans, and her walls were solid with pictures. In her rude way she was reaching after the beautiful. We do not want to forget that in our country homes. Any who have gone to

Digitized by Google

remote regions, beyond the reach of grass, when you get back to the land of grass, you wanted to get down on your knees and kiss the sod. There is nothing more beautiful. We do so many things ignorantly. There was a friend of mine in Marion County who was worth about $25,000 and was a fine specimen of a farmer and neighbor. He was a good man and a good neighbor in every way. I was at his house one day. He was about seventy and his wife about fifty-five years old. The house was on a rise of ground and they had some fine springs. The springs were at least 100 yards from the house and down the hill. It never seemed to occur to him that he ought to have a well near the house so his wife would not have to carry the water so far. That is only a little thing. Let the man who is able have a windmill. We ignore the things that God gives us to add to the beauty and comfort.

Professor Latta: There is one thing I would like to say, and yet I do not want to trespass on the theme for the afternoon. While our homes, as a rule, are not lacking now in horticultural features, they are lacking in such a grouping of these things as will make a tasteful home. There are horticultural misfits in the geography of our planting. I saw a home in northern Indiana in a well-to-do neighborhood, which had a garden directly in front of the house. That appeared to be a horticultural misfit. If you will only look at the farm homes as you go through the country you will find a few of these misfits.

Mr. Little: I think we make a great mistake sometimes by building our houses in too small a place and not giving room enough for trees. I believe in living back from the road and placing trees around. There is nothing more beautiful than trees. I doubt if you can find any more beautiful home than that of John Morgan on this road. We have a great variety of beautiful trees and I think there is a mistake often made in building too near the road.

The following committees were then appointed by the President:

Committee on Exhibits—Mr. E. Y. Teas, Mr. Henry, Mrs. Stevens.

Committee on Resolutions—J. G. Kingsbury, Mrs. J. Troop, Mrs. Naomi DeVilbiss.

Digitized by Google

Mr. Kingsbury: I want to say something about spraying at every meeting of the State Horticultural Society that I attend. I think without the profession of sprayer, we will never have the perfect fruit that Mr. Barlow enjoyed when he was a boy. I think the fruit was better then. Fruit could then be eaten without the danger of running your teeth into a fat worm. Now you can hardly eat an apple without cutting around the place where a worm has been. This society, it seems to me, should recommend young men in every neighborhood to fit themselves, mentally and mechanically, for the business of spraying. They should learn what is necessary and should prepare themselves with the very best materials and make it a business. Then we could expect good fruit, and unless we do, it is in vain. We can not have perfect apples, or plums, or even cherries unless we spray the trees. Farmers are too much occupied with other matters at the time when insects are most prevalent, and the result is they go without spraying and the fruit is imperfect. I want this Society to resolve that this is a work that is worthy of being made a profession, and we believe it will pay a person in each neighborhood to fit himself for it.

After the noon recess the following paper was read on

AESTHETICS OF HORTICULTURE.

BY MRS. DR. JOHN RAGAN, PLAINFIELD.

Aesthetics pertain to that which is beautiful and pleasing to the eye, or which in any way appeals to the finer sensibilities. It may be characteristic of an object within itself, or its arrangement with reference to something else.

Horticulture, in its broadest sense, includes the cultivation of flowers, fruits and vegetables.

In thinking about this subject, it has seemed to me to embody the idea of cultivating not so much that which is beautiful but rather the cultivation of all things in the most attractive ways. Hence, to combine the two, aesthetics of horticulture means the cultivation of flowers, fruits and vegetables in the way most attractive in appearance.

It has been said that the first query of an American with reference to any enterprise is, "Will it pay?" While this is an essential element to success and in itself is very commendable, yet there are different ways in which to consider the question of "Will it pay?"

Digitized by Google

In this busy old world, with its tired people, there are many things that in themselves count for nothing so far as increasing one's bank account, or enlarging the bulkiness of the pocketbook is concerned; yet I would ask, Will it pay to deprive ourselves of the many things which bring enjoyment and pleasure to the human heart, simply because "there's no money in it?" If we consider the elevating and refining influences of these things they count for much. Therefore, when a plot of ground is to be put under cultivation, if it be necessary, as it is with so many people, to realize in a pecuniary way all that is possible from it, one need not crowd everything upon it, regardless of plan. Neither should he lose sight of the fact that the intrinsic value need not be lessened by giving some attention to artistic arrangement. For instance, if you are planting in rows, make them straight.

I remember when a child of riding with my father one bright June day by the cornfield of a neighbor, in which the hills of corn had been planted so accurately that we could trace the straight rows in seven different directions across the field. While on the opposite side of the road was another field of corn in which not one straight row could be seen. This, though an example of "aesthetics in agriculture," illustrates my meaning. It made a lasting impression on my memory, for never since then have I seen a field of corn without considering the manner in which it was planted.

Again, if the soil is productive alike throughout a given plot of ground, the value of yield would be the same, and the pleasure in appearance would be oftentimes much greater, if more thought and care were given in planting, so that the growing plants would produce the best general effect.

This is true in a garden where vegetables alone are grown, but much more so in a garden where flowers, too, abound.

For instance, imagine a flower garden where no attention is paid to the quality of the foliage, the height of the plants, or the color of the blossom. Where flowers wearing decided colors—as yellow, red and blue—are put together in such close proximity as to detract very materially from the beauty of each, though each within itself may be a thing of beauty. Whereas, if plants bearing flowers of softer tints had been intermingled, not only would each color be more pleasing, but the effect viewed as a whole would be much more artistic.

Though flowers may occupy a very limited space in the garden, they add much to its attractiveness. Perhaps all of us can recall the gardens of some homes—well-kept walks, bordered on either side with flowers, and the vegetables distributed in the most desirable places for them; and perhaps, too, we can remember the great bouquets of flowers which

Digitized by Google

the thoughtful hostess would cull for us to carry away. Such gardens combine beauty and utility in a very practical way.

Let us consider for a moment the description of the first garden of which history gives us any record. It was planned and planted by a master hand, One who did all things well, because He was all-wise. This gardener understood the blending of the countless tints so that no combination of His was ever inharmonious; and in His garden was combined the beautiful and the useful. Hear the description: "And the Lord God planted a garden eastward in Eden; and out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food. The tree of life also in the midst of the garden, and the tree of knowledge of good and of evil. And a river went out of Eden to water the garden. And the Lord God took the man and put him into the garden of Eden, to dress it and to keep it."

In this description you see special mention is made, first of all, that "it was pleasant to the sight." Considering that the same master mind which fashioned that garden furnishes to-day countless varieties of plants, shrubs, and trees, from which to select, and that the soil is already prepared to give proper nourishment to each according to its need—the green for the leaf, the red for the rose, the white for the lily, and many colors in one flower if such is desired—all that remains for us to do is the arranging of the different things. Realizing this truth, can we better show our appreciation of the beautiful things which nature gives us than by trying to place them in a way which is "pleasant to the sight?"

DISCUSSION.

Discussion led by J. G. Kingsbury: The pleasant things in horticulture are referred to by the title. From seed time to harvest there is a succession of pleasures to the lover of this art. To him the straight seed furrow drawn through the smooth, mellow earth is a source of enjoyment. To see the plants pushing through their earthy covering is a greater pleasure; a still greater one is to help make them grow by the use of a rake and hoe. Yes, even work, in the garden among the vegetables and flowers, the shrubs and vines, cultivating and pruning, is a delight to the man or woman who has not been weaned away from Nature's heart by trade, politics, or the follies of fashion and modern artificial life.

We have in mind a friend who is so fond of working among his fruits and vines that he once complained at his strawberries for

Digitized by Google

continuing so long in fruiting, for he wanted to get into the vines and clean them out. He couldn't bear to see them getting weedy.

Propagating plants and producing new varieties is a pleasure akin to that of creating. With what eager interest the amateur or professional pomologist or florist watches the results of his efforts to produce something new and superior, in fruit or flower, and what a keen satisfaction he enjoys when he has succeeded, as did the venerable originator of the Concord grape, Dr. Bull, or our own Granville Cowing of Muncie, with his delicious Brunette strawberry, in adding something to the pleasure of their fellow-men. The same may be said of the originators of our new and popular carnations, chrysanthemums, pansies, the Rambler and other roses, among the flowers.

It is chief among the delights of horticulture that man is thus permitted to be a co-worker with the divine gardener in multiplying new forms of beauty in the floral world.

Rightly regarded, the effect of horticulture is to elevate the soul to loving communion with the author of all that is good and perfect. The poet recognizes this thought when he praises the hand that formed those lovely creations. "My Father made them all," he sings. From childhood we remember the words of a pious old gentleman as he bowed over the flowers in his well-kept garden and smelled their fragrance, saying: "My Father is so kind to have made all this beauty and fragrance for me to enjoy."

Following was a paper on

TREES AND THEIR USE IN RURAL EMBELLISHMENT.

BY MRS W. W. STEVENS, SALEM.

One of the principal objects and aims of the enthusiastic horticulturist's life is to be continually adding something to the attractiveness of the home as the years go by. As a rule too little attention is paid to the embellishment of the rural home. The houses and barns may be conveniently arranged and of imposing structure, but on account of the lack of pleasant surroundings they present an uninviting appearance, and do not give comfort and ease to the dwellers therein. What a pleasure it is to have a home with surroundings so inviting and complete that they are not only a continual source of pleasure to the occupants thereof, but continually elicit remarks of commendation from any visitor and passer-by as well. We all enjoy doing anything that seems to meet with public approval.

Digitized by Google

Men and trees have always been inseparable companions. We might exist without trees, it is true, but, constituted as man is, and established as trees and their functions and properties are, it is plain that the present exquisite order and harmony of things in regard to man's welfare are most intimately and inseparably identified with trees.

If we would consider man and his privileges, the amenities and enjoyments that enrich life, the comforts and ornaments of his home, we can not possibly do so, if we would give all things their fair place, without keeping trees constantly in mind. From the time when all trees pleasant to the sight were set in the first garden down to the building and adornment of the newest country home, have trees given picturesqueness to the landscape, surrounded man's home with beauty, and been to him everywhere objects of attention, companionship and love. In the landscape trees are indispensable to that high and fine quality of enjoyment which we term picturesqueness. We may look out upon a rocky mountain and pronounce it grand and sublime, but we have little sympathy with its somewhat forbidding grandeur. Infinite reaches of rolling prairie, the soil fertile as can be and covered for miles and miles with rich fields of waving grain, may give one an idea of agricultural wealth, but in the absence of trees neither view could be called beautiful or picturesque. Trees clothe the mountain side with loveliness, they break up the outlines of view and give variety of color, movement and shadow; they touch the imagination with an agreeable sense of fruitfulness, or, if they are forest trees, with the idea of nobility and wealth. Indeed, trees are to the landscape what living and moving people are to the town—an element that may be dispensed with, it is true, but if so it must be done at the expense of the finest and most impressive influences. "The truth is," says Hamerton, "that a solitude is not so solitary if there is a tree in it, and if there is a group of trees we feel it to be almost peopled." Indeed, I think it will be found true in the experience of most of us, that those scenes which come home most warmly to our sympathies, and that seem to have a perennial hold upon our hearts, are those that are enriched by the abundance of trees, shrubs and flowers.

For the past 100 years we people of Indiana have waged a war of extermination against our grand old forests. Our forefathers, in opening up their farms, wanted not a tree to be left standing about cabin or hovel—there were trees enough everywhere, and of what good were they except for rails, fuel and sawlogs? Then only the very choicest specimens were utilized. Down came all the rest to be burned in huge heaps, for the early settler seemed in a hurry to rid the ground of every vestige of nature's most beautiful creation. But we are glad to have lived to a day when a higher and more rational public sentiment prevails among our people—when trees are regarded as objects of beauty, deserving our

Digitized by Google

affection and care—when to cut down a beautiful tree is felt to be a kind of slaughter, and to protect them is the sign of a tender and merciful disposition.

In a country of so varied natural beauty as that favored portion of the great Ohio Valley in which our homes have been cast—with its diversified landscape, picturesque views of lake and river, hill and valley, with its healthful climate and productive soil—it should be regarded as a matter of neglect, almost of reproach, if any one buying, building or creating a home for himself and family should fail to embellish it with some portion of that infinite wealth of beauty and charm connected with the trees and shrubs which may be had almost for the taking and planting. It should be a duty with all citizens of town or country possessed of either a small building site or broad and fertile acres to adorn them with those objects of perpetual beauty and service which do not decay as do the cottages and homes which they build, but are a constant source of admiration and delight as the years go on; for trees, unlike houses, temples and towns, do not begin to decay so soon as planted, as those other things do so soon as builded, but they grow and flourish throughout the centuries; nay, we have some with us now that existed at the beginning of the Christian era. What we start now will give joy and confer happiness upon our children's children and their posterity, or upon strangers we know not of, and in long years to come furnish the material which may shelter other generations in homes built from the lumber of which man, ages past, had planted.

In choosing a site or location for a home, first of all attention should be given to the matter of sanitary surroundings. See that there is good natural drainage, an elevated position if possible, one commanding the sunlight in its fullest scope, and in a position to secure pure air. Next, the home grounds should be easy of access, not selected close upon the public thoroughfare, nor yet too far from it, with innumerable gates to open going out or coming in. Have as beautiful an outlook from piazza as possible, and from the windows fine views through clusters of trees, shrubs and vines. Here in this climate we have an extended range of tree growth and beauty as fine as is produced in any other part of the world. Out of the great variety of trees indigenous to our soil there is no difficulty in finding beautiful kinds adapted to any situation. Indeed, I think too many of us are ignorant of our tree wealth, often sending abroad for trees when we have had much better ones at home. One of our United States forestry commissioners says there are not more than fifty species of forest trees in all Europe worth cultivating, while here in our own country we have 800 species, 250 of which grow to the height of thirty feet, fifty to the height of 100 feet, and of the entire number

Digitized by Google

fifty are of the coniferous class. A Scotch gardener who visited this country recently said in writing up his observations upon the country: "I am amazed at the indifference of the Americans to the variety and wonderful beauty of their native trees and shrubs. Their landscape gardeners are trying to grow trees of foreign nativity just for the name of it, at a cost of many failures and disappointments, when they have better kinds all about them at home." So high a recommendation of our trees and their beauty from such a source is surely worth heeding.

We shall omit all details of planting, so far as mere labor is concerned. We would say that trees will grow almost anywhere with us if taken up at the proper time in spring or fall and removed from the forest to the home grounds with care, properly set and cared for until well established in their new home. So far as possible the same conditions should be obtained upon the home grounds for a tree removed from the forest as those to which it had been accustomed. Nursery grown trees grow more readily than forest trees for the reason that, having been transplanted two or three times they have more fibrous roots. But little loss need be sustained if we select our trees from the edge of the wood rather than in its depths. Choose small trees—they are usually of more perfect shape, and in removing them one is sure to take up a greater proportional share of roots than with trees which are larger.

The orderly gardener would instruct us to select only perfect models of trees of whatever variety we wanted to plant, "straight of trunk, symmetrical in outline and beautiful from any point of view." But we like a crooked specimen on the lawn occasionally. It gives variety and prevents the eye from ever tiring of such stiffness and straightness as is presented when every tree on the lawn is straight as an arrow. We do not find trees all so beautiful and straight in the primeval forest. And it seems to us that sometimes trees tire of their own stiffness, and invite the crooked vine to twine about them to give relief. So we would plant a few crooked trees among the straight ones, in order to get the best effect on the lawn.

In planting trees about home grounds of moderate extent it is generally the better rule to have each tree depend for its beauty or ornamental effect upon itself alone, rather than upon other trees. On grounds of large extent or for avenue or roadside planting, trees are often set in rows, groups or pairs. In such cases they depend upon each other to some extent for their best effect; and yet here disappointment may come in. It is impossible to make trees grow alike as time goes on, how carefully soever they may be selected, planted and cared for. One will grow more rapidly than another, or perhaps one meets with an accident which disfigures it; another may die, thus leaving a gap and spoiling

Digitized by Google

the symmetry of our plan. So we think it best to plant so that each tree will depend upon itself for the pleasing effect which it gives, standing in harmony or in contrast with its neighbor, without particular regard to size of others, habits or characteristics.

Grouping or massing trees upon the lawn or about the grounds should be carefully studied. Trees grouped or massed on the northwest side of the house serve as good windbrakes, but we would never mass trees anywhere so they would obstruct a fine view in the distance, nor should they be placed too near the dwelling. There is no hygienic agency equal to that of the sun, the true source of life. Without it plants and animals alike have but a sickly life or slow death. No trees, therefore, or anything else ought to be allowed to keep its healthful beams from striking upon our houses and coming for a while at least each day into all our rooms. Health leaves the house when the sunshine is kept out of it. Some shade on the house during the hottest part of the day is admissible, but don't allow it to become too dense. Over planting is liable to be a very general fault with those who set trees about the small home grounds, just as under planting is usually the case when efforts are made to reforest an area of land. He who is making a new place, especially, is anxious for rapid size and immediate effect, and it is not infrequently the case that from four to ten times as many trees are started as there should be. The small maple which you carry in your hand, the slender elm from the hedge row, or the small evergreen may look lonesome if given all the room when planted which they will require after ten or a dozen years of healthy growth. Thus in a little time they become crowded, and then not only is their charm and beauty as trees lost, but the highest beauty of the lawn is lost also; for nothing will make amends for the want of some space of clear, unobstructed, beautiful turf, on which the sun may throw its light and across which may play the shadows of the clouds. The only remedy for thick planting is the ax. While we may regret to cut down a favorite tree ever so much we should not hesitate to do it if it is necessary to preserve the beauty and symmetry of the home surroundings.

Fruit trees are very much out of place on the lawn. It may suit the practical German to put apple, plum and cherry trees in the front yard, but we would prefer to have them in the orchard, or at least in the back yard. The apple tree in the full wealth of its rich fruitage is a beautiful object 'tis true, but it does not show off to best advantage on the front side of the house. The dropping fruit is not a lawn ornament, and its branches are not beautiful except probably when in full bloom, and then only for a few days. So we would not plant fruit trees when we wanted something for ornament.

Digitized by Google

Harmony of form and color in trees with their artificial surroundings should ever be regarded. Tall, slender trees will not look well beside a low building with a flat roof, nor will broad, round-topped trees beside a tall building with a sharp roof. It is the rule of personal vesture applied to the forms of arboreal beauty. Tall and short men should dress differently. The hat that would set becomingly upon the one would look unbecoming on the other. Color should be studied; not only the spring and summer tints of virgin and mature leaf, but the ripened and brilliant hues of autumn.

Some one may ask, Is there any money in this ornamental work of embellishing the home? We would say most emphatically there is, as well as satisfaction and pleasure. Who would not give several hundred dollars more for a home set in the midst of a fine lawn than one with house standing out in the hot, blazing sun the whole day long without a single tree to cast its shadow and invite the cool breath of the summer breeze across the threshold. We could cite a number of instances where lands have been doubled and trebled in value simply by ornamenting the lawn with trees and giving the home an attractive, comfortable appearance. Not infrequently do we hear of a tree located somewhere upon the lawn being valued at one or two hundred dollars; at least the owner would refuse to part with it for that money. Who, least emotional of mortals though he may be, has not, at some time, if indeed he has not often, felt a tree to be a precious thing, the tired wayfarer, reclining by the dusty roadside under its cool, refreshing shade? What more truly humane picture than that? A party of old and young of both sexes, picnicking on a summer's day beneath the spreading boughs of some grand old oak. How could such a happy scene be complete without that tree? Yonder lofty and majestic elm, the growth of a century, standing beside the farmhouse, which, though ample in size, it dwarfs to a cottage as it rises above it with its dome of shade and tosses its giant arms high over roof-tree and chimney top! What an object to fill one at the same time with wonder and admiration. How it starts deep and meditative thoughts even in the most careless beholder. The lordly pine or hemlock, refusing to be robbed of its beauty at any season of the year, but sighing like a hundred Aeolian harps with every breeze and holding itself before us as an emblem of life and immortality, to cheer us when all around is wrapped in the chill white robe of winter what object on earth, next after the immortal man himself, is more beautiful or more noble? Man can not replace in a lifetime what his ax may destroy in an hour. It has taken a lifetime and more of the past to build up that miracle of beauty—a tree; so let us each and all strive to preserve and perpetuate for the admiration of future generations some of those magnificent miracles of beauty and grandeur yet left us.

Digitized by Google

DISCUSSION.

Discussion was led by Professor W. C. Latta, Purdue University.

Professor Latta: I take it that the people who are gathered here are not like the old Arab that I heard of some years ago. I might tell you of him because it might be the means of converting some to trees. This Arab was observed sitting in the hot sun at his home, by a traveler, who, seeing him there in the heat, said, "Why don't you plant trees and have shade?" His answer was, "Oh, if I do, I won't live to enjoy it." If I thought you were like him I would not have the heart to say anything on the subject. You have listened to an interesting and valuable, and even eloquent paper, and a man speaking extempore, could not heighten the effect. I only want to supplement in some degree what has been said. I may touch on some points, but I want to bring up the practical side of the subject. I also want to emphasize the teaching effect of the tree and call attention to the necessity of some little insight into the nature and habits of trees, in order that we may get the best results from them. On this last point I can not hope to inform you, but I think the discussion will bring out some practical information as to what trees are best for certain aspects and soils. In general I would say that the tree should be adapted to its purpose in form, habit and growth and its adaptation to the kind of soil. In riding along between here and the Reform School my attention was called to a park where they had to haul in a quantity of soil to give each tree a good start. They have evidently studied the feeding of trees. We need to note the combinations of trees. I agree with Mrs. Stevens that we want a tree for its own sake. We can not bring out combination effects on small grounds. There are trees that have the spreading habit, the clumpy habit and the spire-like habit, and trees of variation in shades, and those who have observed them in public grounds know that very pleasing effects can be brought out by suitable combinations, but that takes more room than most of our home grounds could give. I do not endorse these small home grounds, but in many places they could not be made larger, but I want to say to young people starting out, that if you try to make a home on a little 8x10 piece of ground, you will be sorry for it. Let me recall a point here. It will come up

Digitized by Google

in your experience in the development of home grounds. It is my own experience. During my college course I was put in charge of the walks and drives of the campus, perhaps sixty or more acres, and I set to work with edging shears with great enthusiasm as I went over my work, but I had short-lived satisfaction. In one week I was shocked at those curves. You will have the same experience, and in this kind of work of tree planting it is not easy to correct your work. I want to endorse a point in the paper that we should seek the ornamental trees rather than the economic in our door yard. I do not like a fruit tree in the front yard, no matter how beautiful it is. The economics ought not to go into the front yard. The economic and the aesthetic do not mix. The fruit tree frequently becomes imperfect in form. Will you not bear me out in this statement that you have seen farms in which the sore spot was a few old apple trees?

As to the number of these trees. Again I find myself in accord with the writer. It is natural to overdo and it is hard to undo. We can not bear to take out a tree that we have nursed for years. In looking around even here I can see where the ax could be used to advantage. The trees keep growing and spreading, and when they get beyond a certain point it is hard to take one out without spoiling the effect. A densely shaded lawn is a gloomy, unhealthful spot. We want to have in mind the effect ultimately. I should advise planting thick enough to take some out. In regard to the disposal of these trees I did not note this point in the paper. The disposal is a very important matter. There are two great objects in view in planting trees around a home. I fancy that most people think of the effect it will have in setting off the house. That is, "how it looks to the other fellow." There is another side. How does it look to the inmates who look at it from the inside? We want to plant these trees so they will give a beautiful setting and surrounding to the home. We want the place to look attractive to our friends and as we come home. We want to plant what is attractive and beautiful and also shut out what is not so. Have you ever thought what a striking advantage the farmer has in the way of home embellishment that the man in town does not have? The banker with his fine dwelling may have some disagreeable old smokestack within 15 rods of him and he can not shut it off. If you will notice in the city you will see these things. You locate

Digitized by Google

on the center of your farm and want to be monarch of all you survey. No matter how unsightly a thing may be near you, you can shut it out from view forever by a tree or two, and you can make it more beautiful by suitably placing the trees. The man in the country has the power to do this if he has the artistic sense and judgment to do this work. We plant these trees for their shade, for their combination effect; we plant them to some extent as a windbreak and a screen. There is one mistake made more than any other in the disposal of trees, and that is in straight rows. We have forgotten the purpose. We plant a tree here that will give shade or make a pleasing combination and we forget for the time being that we want to assist nature and don't want the marks of man's handicraft. You do not find trees planted in rows by nature. Straight rows are allowable on the roadside, but they are stiff and lacking in taste in the home grounds. I now come to the part that I want to emphasize. What is the tree without its setting? What is the diamond without its setting? It loses all its utility and half its beauty. What is the setting of a tree? That is a beautiful, grassy lawn. That is necessary to give the best setting for trees. Here it is necessary to have sunlight to make the grass grow. If there is anything more neglected on the farm than the old apple trees, it is the farmer's lawn. It is not as easy to have a good lawn as it is to set out a few trees. It takes care, but a good lawn can be made on any soil where grass will grow. I wish I had Mr. Ragan here to tell you about our lawn at the Experiment Station. I came to Purdue in 1882. I found a bit of black soil by the experiment station and all that was done that fall was to level it. It was simply bare ground. That was leveled and allowed to stand during the winter. It was good black soil, and the next spring it was releveled. It left a very even surface. That is very necessary to a good lawn. Do not sow grass without evening your ground in good shape. This was sown with oats and afterward we sowed a mixture of grasses that do well with oats. The oats were thoroughly harrowed and then raked in. When the oats were three inches high we began going over it with a lawn-mower. The farmer has observed that in the spring the wheat, corn and oats ground is not as dry as where there is no crop growing. It seems to give an encouraging condition for young grass. As soon as we began to cut the oats it began to

Digitized by Google

form a light mulch. By the first of August the oats were killed out and we now have a beautiful lawn. Mr. Ragan remarked that he never had seen so good a lawn made in such a short time. When you have shapely trees on a beautiful grassy lawn you have a home where men and women of generous mold, with good ideas, can be developed.

Mr. Burton: I had particular instructions before I left home to ask how to keep out quack grass. About this time of year it gets so thick we can't cut it with a lawn-mower.

Professor Latta: I did not promise to answer the hard questions. Perhaps I did omit one thing, and that is in our selection of grasses we naturally had to recognize the natural adaptation of the soil. I do not know whether blue grass can be readily grown there or not. I do not know how to kill out quack grass in the lawn. I believe I would mow early and late.

Mr. Sylvester Johnson: I listened very attentively to the paper and discussion, and there is much to commend, especially in Professor Latta's discussion. I want to emphasize what he said about the lawn. He did not exaggerate the Purdue lawn. There is just one thing in the paper about which I am not quite able to agree with the writer, although she and I hardly ever disagree on anything, and that is these crooked trees. I can not quite get myself educated to plant crooked trees if I can get straight ones. I don't like them. There is another thing that I like to see straight and that is straight corn rows, and I despise to see crooked corn rows. Not only in the corn field, but I also want to see them in the garden, but I don't want to see them in the front yard.

Mrs. Stevens: In defense of my crooked tree idea I will say that when Mr. Stevens and I were married I had never lived in the country. We moved on a farm just outside of town. The first thing he did was to stake out about 20 acres of wheat land and put in trees. It cost as much to fence it as the land was worth. Mr. Stevens said that he hoped to have in twenty years timber more valuable than that. In speaking of the lawn, I will say that the yard is the most neglected. This is what we had. We decided to take out the fence and have a lawn. We now have about sixteen acres. You people here do not know how pretty a southern maple

Digitized by Google

tree is. He decided that they must be perfectly straight, and it was more trouble to get them straight than anything else. Our representative of forestry came down and asked what made him plant a sugar orchard in the front yard. I was completely disgusted when my eyes were opened. He said the object was to get them planted as near like the forest trees as possible. Nothing has done it so effectively as the crooked tree.

Mr. Little: I think that Mrs. Stevens is right in her description. Suppose you would employ some person to paint a nice landscape. If he would make all the trees nice, you would condemn it, as there would be no variety in it. When I go to the forest, my greatest delight is scanning the variety of trees. There used to be a mistake made in cutting trees back. There is nothing more beautiful than to have the trees as nature made them. In planting trees we plant them for beauty, but how many will think of the intrinsic value that is added to our homes by planting trees? We sometimes pay big prices for homes and farms simply because we admire the trees. While we are ornamenting our grounds by planting trees, we are adding great value to them.

Then followed a paper on

SOME GOOD FLOWERING SHRUBS FOR THIS LATITUDE.

BY C. M. HOBBS, BRIDGEPORT.

By flowering shrubs we mean the low growing, bushy, hardy, flowering shrubs that are planted on our lawns for their individual beauty, or in clumps for their collective effect. Such shrubs are well adapted for the embellishment of our lawns because of their hardiness, the ease with which they may be grown, their variety of form, color of foliage and bloom, and the fact that if proper selection is made we may have them flowering in succession from very early spring till late in the autumn.

If shrubs are planted singly they should be kept healthy and vigorous, not lacking for moisture or fertility, and always of shapely and attractive form by proper pruning. When grown in clumps or masses, the taller growing varieties should be placed in the center and the lower ones on the outside, that all may show to proper advantage; if to be seen from one side only, the taller shrubs should be in the rear and the lower in front. The taller growing shrubs may be used with good effect in screening from view unsightly objects; the lower growing kinds for hedges and borders to walks and drives.

Digitized by Google

There are hundreds of varieties of cultivated shrubs. I think it not best to confuse the planter with a long list of names, many of these not being hardy or adapted to this latitude. We will mention a few of the most desirable varieties for our locality, covering as nearly as possible the entire season in their blooming, and will name them as nearly as possible in their order of flowering.

Magnolia stellata is the first shrub to show bloom here, commencng to bloom about the 15th of April this year. This variety is comparatively new. It is a low growing, upright, compact shrub with good form and foliage and perfectly hardy. The flowers appear before there is any foliage, are two to three inches in diameter, star-shaped, pure white and very fragrant.

Magnolia soulangeana, speciosa, alexandriana, lennei and others are stronger growing, larger leaved, and blooming a little later than the stellata. The flowers are larger, pink and white, with little fragrance. These varieties usually kill to the ground in very cold winters, sprouting up again from the roots the following season.

Magnolia glauca is a native of some of the Atlantic States. The shrub attains considerable size, is rather straggly or open in habit, perfectly hardy here, leaves small compared with other varieties, of dark, glossy green. The flowers are about three inches in diameter, white and very fragrant; it is the latest blooming of the magnolias.

Forsythia, golden bell, is not entirely hardy, killing back considerably in very cold winters. It is of medium height, with spreading, drooping branches. About the middle of April the under side of the branches are heavy with small, bright yellow, bell-shaped flowers, hence the name golden bell. If this shrub can be planted on the south side of buildings, or where it can have protection against the northwest winds, it will prove quite satisfactory as an early bloomer.

Exochorda grandiflora is entirely hardy here. It attains about the size of the common syringa, blooms about the 25th of April, flowers about the size and shape of the syringa, without fragrance. Its hardiness and early blooming, pure white flowers with bright green foliage, make it desirable.

Spirea thunbergii blooms with the exochorda. This is a rather low growing, bushy form of spirea, with graceful, drooping branches and very small, narrow leaves. The flowers are very small, double, white, and appear in great profusion before the foliage. This is not a very conspicuous shrub when in bloom, but its graceful, drooping habit and fern-like leaves make it an attractive object the season through.

Spirea prunifolia, bridal wreath, follows the thunbergii, with its mass of very double, small, pure white flowers. It is hardy.

Digitized by Google

Cydonia japonica, Japan quince, robes itself in scarlet about May 1st, and with its contrasting green leaves is always the most attractive thing on the lawn at that season. Extremely cold winters kill the flower buds, and it is not always reliable in blooming. The scarlet and pink are the most desirable varieties.

The Flowering Almond is not to be despised if it is quite common. Blooming early, with its small, very double, bright pink flowers in great profusion, it never fails to gladden the eye.

Beginning about the 1st of May and continuing till the 1st of June, we have a great variety of lilacs. These are among our best shrubs. Hardy, easy to grow, making a compact, stately shrub when properly trimmed, and with a proper selection of varieties will continue in bloom for a period of thirty days.

Syringa vulgaris, or common purple lilac, is desirable on account of its color, fragrance and free blooming habit. The common white is pretty, but very tardy in coming to flower. The Alba Marie is a shrub of better form, comes early into flower, and is a satisfactory single white.

Madam Lemoine is the most desirable double white. The shrub is vigorous, compact, symmetrical in form, good foliage, early and free bloomer, with very large panicles of pure white, double, fragrant flowers. Charles X is a strong, vigorous bush, good foliage, very large trusses of reddish purple flowers. Pres. Grevy is a beautiful blue, double, large panicles, and very satisfactory. Lovaniensis, silvery pink, distinct panicles, large and showy. Ludwig Spaeth, purplish red, long panicles, showy, fine.

Of the very latest bloomers, as far as we know, there are no varieties superior to Josikaea, purple; and villosa, light pink. These are distinct, compact, shapely shrubs from Japan, large leaves, making fine appearing shrubs when not in bloom. To my taste the villosa is one of the prettiest of lilacs; the panicles are large, branching; the buds are pink before opening and white when open, giving the panicles a very delicate pinkish white shade, with a pleasant perfume. These two varieties bloom the last of May and first of June.

The Japan tree lilac, so far as I know, is the latest of this family in blooming. This is a strong grower, shaping up like a tree and attaining several feet in height. The flowers are in large panicles, creamy white and fragrant.

Syringa persica, or Persian lilac, is a pretty shrub blooming with the common varieties. They attain a height of six to eight feet, are rather spreading and open, leaves small, and the shrub somewhat resembling the privet. The flowers are in large, open panicles; two varieties, purple and purplish white; fragrant.

Digitized by Google

Viburnum sterilis, or snowball, is an old and deservedly popular shrub on account of its hardiness and vigor, and its mass of balls of sterile white flowers. Blooms here from middle to last of May.

Viburnum opulus, or high-bush cranberry, resembles the common snowball, except that the flowers are small, perfect, appearing in broad panicles, and followed by small bright red berries that hang on till cold weather.

Viburnum plicatum, or Japan snowball, is decidedly the prettiest in shrub and flower of this family. The shrub is medium in height, rather compact, foliage rather large, with distinct corrugated leaves. Flowers in large, compact balls, pure white. It is not entirely hardy here, kills back some in severe winters.

Lonicera tartarica, or upright honeysuckle, blooms here from the 5th to the 15th of May. There are several varieties, but for general planting two varieties will answer, the pink and white. The flowers are small, not very conspicuous, slightly fragrant. The beauty of the shrub lies in the symmetrical, compact form of the shrub, and its dark, fresh green leaves the season through.

Spirea van houttei flowers here usually from the 10th to 20th of May. This is certainly the finest of all the spireas. Perfectly hardy, four to six feet in height, open habit, long, graceful, drooping branches covered with a mass of compact bunches, or balls, of white flowers. It has to be seen to be fully appreciated.

The chionanthus virginica, or white fringe, comes into flower about the 20th of May, and continues about a week. The shrub attains a height of eight to ten feet, and has large, glossy, dark green leaves the season through; is a fine shrub when not in flower. The flowers are in long, open, gracefully drooping racemes, pure white, with a rich spicy fragrance resembling the carnation. The Purple Fringe, or smoke tree, is less desirable; straggly in habit and given to blighting.

The diervilla, or weigela, is a deservedly popular shrub, of which there are many varieties. But considering hardiness, regular and abundant bloom, there is nothing surpasses the rosea. The rosea grows four to six feet in height, rather spreading, and the slender branches are literally loaded down with large, bright pink, bell-shaped flowers. Eva Rathke, a new variety, is said to be a brilliant crimson and very fine. The white varieties do not bloom sufficiently, and are of a dirty white, unattractive color.

Philadelphus, or mock orange, erroneously called syringa, flowers the last of May and first of June. Generally this is a tall, rather open, straggly bush. There are several varieties; the large flowered, fragrant variety is very fine. The flower is large, pure white with sweet fragrance.

Digitized by Google

Deutzia crenata flore plena, or double flowered deutzia, is to my taste the prettiest of its class. The shrub stools out from the ground numerous slender branches four to six feet high. The flowers are well distributed along the stems, rather small, double. The outer petals are pink on the outside, the inner petals pure white, making a combination of pink and white that is delicately beautiful. Unfortunately severe winters here kill it to the ground. I have never known the roots to be killed.

Beginning with the first of July a number of spireas begin blooming, and continue through the month, when there are few if any other shrubs in bloom.

Among these are spirea billardi, having small spikes of pink flowers through July and August; spirea douglassi, with large spikes of small rose-colored flowers through July and August; spirea callosa alba, a low dwarf shrub covered with a profusion of white flowers through June and July; spirea anthony waterer, a very low dwarf shrub, flowers dark pink, blooms in profusion from first of July till late in the season, the most desirable of the late spireas.

Hibiscus, althea, or rose of sharon, begins blooming here about the middle of July, and continues for three or four weeks. There are a great many varieties of these, double and single, with various shades of red, purple and white. Unfortunately these fine late bloomers are quite tender here when young; if plants can be protected from the severe winters for a time, until they get some age, they will stand most of our winters.

Hydrangea paniculata grandiflora, or large flowered hydrangea, is one of the most satisfactory shrubs in cultivation. Perfectly hardy, commencing to bloom the first season after planting, and continuing in flower from the first of August well into September. If it can be planted in a moist, rich situation, with partial shade, it will astonish us with its immense pyramidal panicles of white flowers for nearly two months.

There are a few shrubs that are desirable on account of their attractive foliage the season through. Some of the most desirable of these are cornus sanguinea variegata, or the red-branched, variegated-leaved dogwood. Planted in a cool, moist, shaded situation, this is a very handsome plant summer and winter. The leaves are of medium size, light green, clearly margined and splotched with white. At a distance the leaves appear to be flowers. In winter the branches are bright red.

Sambucus aurea, or golden leaved elder, resembles the common elder, except that it blooms but little and fruits none. The leaves are a glossy, rich green, with a rich yellow that makes it very showy.

Prunus pissardi, or purple-leaved plum, is one of the best purple-leaved shrubs. The leaves are a dark purple the season through. Berberis purpurea, or purple barberry, is a good, low-growing, purple-leaved

Digitized by Google

shrub. Diervilla variegata or variegated weigela, there are two varieties, one with green and yellow leaf, the other with green and white; both are quite pretty.

Philadelphus aurea, or golden-leaved philadelphus, is pretty but winter kills in severe weather. Hibiscus variegata, or variegated althea, has a very distinctly marked foliage of white and green.

Some of the best shrubs that are grown on account of the attractiveness of their fruit or berries, are the barberries; euonymus americanus, or strawberry tree, with red and white fruit; the lonicera tartarica, or tartarian honeysuckle, with red and yellow fruit; symphoricarpus racemosus, or snowberry, with white berries most of the winter; viburnum opulus, or high-bush cranberry, bright red fruit in large clusters till severe weather.

We have not mentioned here the dogwoods, double flowering peach, cherry, and many other varieties. On account of their size they properly belong to the class of flowering trees. There is a small, bushy tree of recent introduction that might be included in the list of shrubs, that is, the double flowering crab. This is a sport from our native crab. It is of rather low, bushy, compact habit, blooming about the period of our common varieties of apple. The flowers are large, very double, appearing all over the tree in great profusion, color light pink. The flowers are so large and double that they resemble small roses, and have the delightful fragrance of the wild crab. I know of no small tree or shrub more attractive when in full bloom than the double flowering crab; the only objection to it is that it remains in bloom but a few days.

DISCUSSION.

Mr. Davis: I would like to ask if that cranberry is what is sold for the tree cranberry? Is the fruit good? Is the barberry good to eat?

Mr. Hobbs: That is the tree cranberry. I do not like the fruit. There is an edible variety of barberry.

Mr. Davis: Is this the barberry that is used for hedges?

Mr. Hobbs: Yes.

Professor Latta: I would like to ask about the winter effect on these shrubs. To what extent is it advisable to plant shrubs on the lawn? What proportion of the planting should be of shrubs?

Digitized by Google

Mr. Teas: I think a clump of shrubs on a lawn of reasonable size is so essential in the summer time that they can be gotten along with in the winter.

Professor Latta: Is the clump method the best for planting on the lawn?

Mr. Hobbs: That depends on the size of the lawn. If large, I think the clump is desirable.

Mr. Ratliff: I will state for the benefit of the Society that the Pan-American Exhibition will meet at Buffalo next year. It is the object of the commission to have on exhibition American fruit in connection with other exhibits, for the purpose of showing what can be produced in the northern hemisphere. These fruits would have to be secured, packed and placed in cold storage for the early part of next year's exhibit. First, to show what was grown in 1900. Second, to test the value and efficiency of cold storage, and third, to keep up a continuous display of ripened and fresh fruits grown the year previous. In a letter I received, I was urged to bring the matter before the State meeting with the hope of getting the co-operation of the society, or at least enough from individuals, to make a creditable display. It is true that California can furnish and keep on exhibition a greater variety of fruits than we can in the middle States, but Indiana fruits at the World's Fair were not complete. Last season some members of our Horticultural Society, as well as those of other States, succeeded in selecting and preparing American fruits that were shipped abroad under the cold storage system, and it is very gratifying to state that at the Paris Exhibition, Indiana fruit came off second. This Pan American exhibition is near at home, and I am willing to give my time and fruit to aid in making the exhibit a success. It is likely premiums will be awarded to enable people to make exhibits. I think it is our duty as a Society to get up sufficient interest to assist in making a creditable Hoosier display. I speak of this matter at this time as the fruit ripening in the early fall and winter will be the only fruit accessible and which will keep in cold storage for next year's exhibit.

Professor Troop read a letter from Wm. A. Taylor, Assistant Pomologist at the Paris Exhibition:

Digitized by Google

Prof. James Troop, Sec'y Indiana Horticultural Society, Lafayette, Ind.:

My Dear Sir—Having just returned from the Paris Exposition, where I have had charge of the U. S. Horticultural Exhibit, it gives me pleasure to inform you that in the temporary competition of June 27th, the collection of apples of the crop of 1899, exhibited by your Society, was awarded a second prize, "Deuxieme Prix," by the jury of awards.

The collection installed for that competition consisted of five (5) varieties displayed in quantity. They were collected by Mr. Walter S. Ratliff, Richmond, Ind., and were furnished by growers as follows:

Ben Davis—C. Rodenburg	Richmond, Ind.
Ben Davis—Alice Eliason	Richmond, Ind.
Ben Davis—Richard Sedgwick	Richmond, Ind.
Gilpin—Richard Sedgwick	Richmond, Ind.
Indiana Favorite—Dill Addleman	Richmond, Ind.
Mann—Columbus King	Centreville, Ind.
Stark—Dill Addleman	Richmond, Ind.

The fruit was in fair condition but had apparently been rather too ripe when placed in storage last fall.

The outlook is good for choice American fruit in the markets of France as well as in other European countries.

Thanking you for the active interest you have taken in the success of the fruit exhibit, and trusting that it will be of distinct benefit to your State, I remain, Very truly,

WM. A. TAYLOR,
Acting Pomologist.

P. S.—In addition to the above I would say that the specimens of the fruit of most of the varieties in your collection were included in the general collection of apples of the United States of the crop of 1899, which was awarded a first prize in the same competition.

DISCUSSION.

Professor Troop: It seems desirable that we take some action on this subject at this meeting.

Mr. Burton: I am not posted on this particular exhibit, but I did send about two barrels of apples to Paris, but when I started them I hardly expected they could be sent. I thought they were too ripe. If we undertake this matter we want to be very careful to know who is going to pay the expenses and what is to be done. In case we save our apples we must save them in time. The De-

Digitized by Google

partment of Agriculture sent me the paper to wrap them in. We should have arrangements made so as to know where to get this paper. I would like to ask if the Society is able to bear the expense?

Mr. Hobbs: I would suggest that this matter be referred to the Executive Committee.

Professor Troop: I do not think it is known what the expense will be. As far as the Society's finances are concerned, they are getting rather low and probably by the time we hold our annual meeting we will be at the bottom of our pile. I don't know whether the exposition will bear the expense or not. Last year the Government bore all the expenses after they were put into cold storage, and also paid the freight. I think very likely if the Society makes an exhibit at Buffalo next year it will have to pay the expenses. It seems to me that the State should be represented there. It will be no small fair. I was there about two weeks ago and went through the exposition grounds and was in the horticultural building. It is going to be an immense affair. It will be as large as the horticultural building at the World's Fair, and some of the other buildings will be larger than the World's Fair buildings. I think we ought to take some interest in the matter and have our State represented. In order to do that we will have to begin this fall.

Mr. Flick: Could the Executive Committee take this matter under advisement and report just before the State Fair? Would it not be a good plan to do this?

Mr. Burton: If we are going to save our early apples we must begin at once. Some will have to be gathered before the State Fair, and this matter should be acted on in a few days and information given out to all horticulturists. I am willing to help make this exhibit. Some varieties should be gathered and placed in cold storage before the State Fair. This should be referred to the committee.

Mr. Ratliff: I move that the members give this matter thought and that it be the first thing disposed of at the morning session. It will be almost impossible for the officers of the Society to esti-

Digitized by Google

mate the expense connected with an exhibit of this kind. In some parts of the State there is more fruit than in others. If the Society does not feel like bearing the expense, each individual could, and if he did not get the direct benefit out of it, it would help the cause of horticulture.

Motion seconded and carried.

Adjourned.

EVENING SESSION.

The following is a brief abstract of Prof. W. C. Latta's illustrated lecture on "Agricultural Education" delivered at the evening session:

Agricultural education is thoroughly established in many European countries, but it is comparatively a new thing in the United States. The oldest of the existing agricultural colleges was established only a little more than forty years ago, near Lansing, Michigan. In 1862, Congress first made provision for the establishment of agricultural colleges in the several States and Territories. In 1889, Congress passed another act, making increased provision for these land grant colleges. Nearly every State now has an agricultural college. For a number of years these colleges did not prosper. This was due partly to meager equipment and inexperienced teachers and partly to the distrust of the general public as to the value of scientific training for the farmer. Gradually these colleges have come into favor and their patronage is increasing from year to year. A number of the States, notably, New York, Ohio, Michigan, Wisconsin, Illinois and Iowa, have made very liberal provision for agricultural education.

Notwithstanding the meager equipment and limited facilities of the Indiana Agricultural College, substantial progress in agricultural education has been made in Indiana.

The agricultural graduates of Purdue (the Indiana Agricultural and Mechanical College) are largely engaged in the several agricultural pursuits for which they were trained. Nearly all the two-year and winter-course students of the School of Agriculture are now engaged in farming. The agricultural course at Purdue is doing well the work for which it was intended. It should have the support and patronage of the farmers, fruit-growers, stockmen and dairymen of the State.

Digitized by Google

The purpose of an agricultural education is three-fold.

1. To impart a good general education which tends to make strong, public spirited, helpful men.

2. To give a training in the natural sciences with special regard to their applications to agriculture.

3. To inspire young men and young women with a love for agricultural pursuits so they will engage in farming from choice, and not from necessity.

Many of the earlier agricultural graduates of Purdue are already succeeding well on the farm. They are demonstrating the feasibility and advantage of uniting science with practice in farming. They are taking an active interest in local affairs and lending a helpful hand in the enterprises which interest their respective communities. They are broader, truer and more helpful men and citizens and more successful farmers as a result of their training at Purdue. The school of agriculture not only merits the moral support and patronage of the farmers of the State, but should be provided by the State Legislature with better buildings, better equipment and a larger teaching force. The demand for agricultural education is just beginning to grow and those States which promptly equip their colleges to do the work that is needed will lead the van in agricultural education. Indiana is a great agricultural State and should have an agricultural college second to none in the country.

DISCUSSION.

In the absence of Mr. H. F. McMahan, who was to have led the discussion, Mr. J. B. Burris, of Cloverdale, was called upon.

Mr. Burris: I presume the reason I am called upon to say something is because I am a Purdue graduate. I do not know that that is at all complimentary to the institution, but I have always been glad that it happened.

There is one point I want to mention, and that is the per cent. of Purdue graduates that leave the school and go back to the farm. When I went back to the farm, the people looked on the methods which I tried to introduce in an incredible sort of way. Do not do this. It is unfair. If a graduate of Purdue comes among you, let him have his own way without ridiculing him in any way. If his methods are new, see if they are practical. If there are any people who are slow to adopt new methods, it is the farmers. The American farmer is a king. Sometimes we think our lot is a hard

Digitized by Google

one. There is much to learn. A little more than a year ago I returned from a trip around the world, and I repeat that the American farmer is a king. No place will you find such farmers and such progress as in America. Germany, with its boasted agriculture, uses very little machinery. I want to say that our condition is vastly better than any other country. When words are spoken in regard to agricultural education, many are inclined to think it is something the average farmer can not interpret. That is not so.

Adjourned.

FRIDAY MORNING, AUGUST 17.

The matter of the Pan-American exhibit was taken up and discussed.

Moved and carried that the matter of fruit exhibit at Buffalo be left to the Secretary, Prof. J. Troop.

Professor Troop: I want to make a request of the Society that if any one here has or knows of specially fine apples, that you correspond with me.

The next was a paper on

THE GROWING OF FANCY STRAWBERRIES.

BY J. D. NEICEWANDER.

Through the courtesy of your local committee on programs a paper on "The Growing of Strawberries" was assigned to me to be read at this meeting of your Society. The subject as assigned is without limitation, and treated broadly only the more general principles could be considered in a paper such as is expected on this occasion.

After thinking the matter over, I felt that a more satisfactory as well as profitable paper might be written on some special branch of the subject.

Selection and preparation of soil, systems of growing, tillage, varieties, picking, marketing and the like have been elaborately written about alike by the gushing theorist and experienced grower, and little new can be added, although much might be eliminated. Writers on this branch of

Digitized by Google

horticulture are apt to round out and embellish the facts with a boldness of fancy hardly inferior to that of Jules Verne in his palmiest days. Everywhere the guileless reader is led to believe that here indeed is a varitable Klondyke of teeming riches. One modest grower writes that he has just harvested from 12,000 to 14,000 quarts of choice berries from an acre and sold them at from 15 to 20 cents a quart, wholesale, thus realizing the enormous returns of from $1,800 to $2,800. One thousand dollars per acre is as easily achieved—on paper—as falling off a log. The fact is, the growing of strawberries seems to inspire an exuberance of feeling, and richness of fancy exceptional in horticulture. The berry is itself typical of this spirit. It represents to the sight and taste the most exquisite properties of nature. After all much must be forgiven to the grower of this prince of fruit.

In the preparation of this paper I have avoided, as far as possible, the merely theoretical and have endeavored to sketch, as faithfully as may be, my own experience with the strawberry. All varieties of strawberries now in cultivation in this country are the products of hybridizing, crossing and recrossing of two American species—F. Virginiana and F. Chilensis. The Virginia strawberry is a somewhat small plant with thread-like roots which penetrate deeply the soil and resist the hurtful effects of the extreme heat of summer. It sits deep in the soil and hence is not easily injured by winter freezing. The stem of this native species possesses a natural tendency to divide at the base, old plants often exhibiting several divisions. The Chili strawberry plant is larger than the Virginia, its roots thick and fleshy and more superficial as a rule. For this reason they suffer more from the August sun—summer-killing as it is called. The stem of this species divides or branches at the top and tends to grow up out of the soil, often presenting a shouldered appearance, thus making it an easy victim to the destructive effect of alternate freezes and thaws. The fruit of the Chili berry is larger, handsomer and milder flavored than that of the Virginia, and being suited to the climate of western Europe, especially England, has always been a favorite there. On the other hand the comparative severity of our climate, especially as regards heat and humidity, has compelled the American grower to depend largely on the hardier, though less attractive, Virginia berry. Of late years, scientific American growers have given much attention to the improvement of the strawberry by the introduction of new varieties embodying the best characteristics of both native species, until to-day our best varieties, while well adapted to our climatic requirements, are unsurpassed anywhere in the world for beauty, quality and size.

From the general facts just given it will be seen that an intimate knowledge of the characteristics of the two native species is indispensable

Digitized by Google

to an intelligent improvement of existing varieties. But this of itself is not sufficient. The scientific strawberry grower must add to this a thorough knowledge of soil and climate. Improved varieties result from a judicious combination of all these facts according to the law of mutual adaptability. This industry has lost thousands of dollars by the injudicious dissemination of varieties possessing nothing but the most local adaptability and practically worthless outside of its native environment.

Passing from this statement of general facts, I shall proceed at once to the subject of this paper, "The Growing of Fancy Strawberries, or Growing Strawberries for the Fancy Market." What are fancy strawberries and how may they be grown are the foremost questions in this connection. I shall attempt to answer the latter first. The wide-matted row, the narrow-matted row, the modified hill and the hill are some of the many systems by which the strawberry is grown. Of these I prefer the hill or modified hill as productive of the finest strawberries and as best adapted to the growing of strictly fancy berries. Given a sufficiently fertile soil and suitable varieties, the hill system yields the finest berries. The modified hill—that is, the old plant with the addition of not to exceed four suitably spaced runner-plants, is nearly as satisfactory. The matted row is unsuited to the growing of high-grade fancy berries.

What is a fancy strawberry? Doubtless every grower feels more or less competency to answer this question. I have never yet become acquainted with one whose modesty impelled him to admit that his berries fell far short of a fancy standard. Now, it is a fact that many strawberry growers do not know what a fancy strawberry is. They think they do, but they are mistaken. The grower of fancy strawberries is guided by a clearly defined ideal. To the ordinary grower a strawberry is a strawberry. To the fancy grower every strawberry has a distinct individuality and to be fancy must satisfy his ideal. The common grower is impressed by the quantity merely, the number of gallons, crates or bushels, and is oblivious to the individual. Ideals vary; some are high, others low, thus giving rise, anomalous as it may seem, to grades of fancy berries. Let me try to describe a high grade fancy berry. It should possess a very high degree of merit with respect to each of the following essentials: Firmness, color, form, size and quality. Freshness is a condition always assumed, without which the fancy strawberry could not exist. The most important of the essentials named is firmness. Without firmness a strawberry loses its individual identity and becomes a formless mass of unsightly pulp. The important element of form is regularity of surface rather than shape. Rough, ridgy, cox-combed and fan-shaped forms are undesirable. The position and arrangement of seeds must not be overlooked. Strawberries with depressed seeds will not bear handling

Digitized by Google

and the crowding of seeds about the apex of the berry is unsightly. As to size, the bigger the better. In color, the element of glossiness is foremost. A glossy mahogany red is much sought after. The Warfield and Brunette are fine examples of this type. A bright glossy strawberry color—that is the natural color—is my favorite, and is very popular in the Indianapolis market. Quality is the least important of the essentials named. Yet it should be the very best attainable without a sacrifice of the more important elements. The berry I am trying to describe should possess a distinct aroma and flavor; should be neither excessively sweet nor sour, and with a moderately juicy pulp. The calyx should be green, not too large, and easily detachable from the stem.

Now a few words as to varieties. It is time wasted to extol or recommend any particular collection. Only a very few berries have sufficient adaptability to be called standards. The introducer of new varieties who would avoid the notoriety attaching to kinship with Ananias should be careful to qualify his descriptions. Every statement of fact should be accompanied by its circumstantial if's—soil, tillage, method of culture, pollenation and climate—these are a few qualifying incidents in ever varying degrees of potentiality.

There are, however, a few varieties of conspicuous merit—that is, of considerable range of adaptability. It is not revealed to man as to which is foremost in this group. Nothing would be more perplexing to our distinguished presiding officer than the personally addressed query, "Which is the best strawberry?" The speaker's innate modesty forbids his naming it. He proposes, however, to nominate a very few candidates for the distinguished honor. The qualifications are a well-drained and fertile, sandy loam, thorough tillage and the hill system.

Of more than forty varieties tested, the Enormous easily leads all others. The Warfield is second and has always held this position. The Warfield, as I grow it, comes more nearly meeting the requirements of a high-grade, fancy berry than any other I have ever tested. For an extremely late berry the Aroma is preferred. I do not know of a profitable early berry. I have had one paying crop of Brunette's in five years. This berry is overrated as to quality. Its one salient, gustatory fact is sweetness. It is almost entirely flavorless but of surpassing beauty. It is the berry for impaired digestive conditions and may be eaten with impunity when other varieties have a hurtful effect. Of new varieties, Splendid, Clyde and Ridgway are promising. The Glen Mary is a failure. Of old varieties now under trial I am favorably impressed with Parker Earle and Haverland. Of the many new varieties introduced and exploited in the past ten years, in language that would beggar the hyperbole of the Chinese Boxer in describing the virtues of the allied forces now haply in

Digitized by Google

Pekin, the great majority have passed into a desuetude, so inocuous as to be unworthy of mention.

In this connection I wish to submit some general facts that have come under my observation. Different varieties represent distinct types of plant growth. Some assume the rosette form, their leaves spreading rose-like on the ground. Others form a dense top of more or less erect short-stemmed leaves. Still others develop a loose open top, composed of a few long stemmed leaves.

Few of the rosette type have done well with me. Without exception, the compact, closely-crowded cluster has proved a failure. The profitable varieties have all come from the loose, open top type of growth. Not all the varieties of this type have proved profitable, but none have failed to produce fruit. There is doubtless an explanation for these facts which I respectfully submit to strawberry growers present.

Finally, Mr. President, the grower of fancy strawberries must sacrifice something of the grosser element of his business to his ideal. That is, he must be satisfied with a smaller yield of berries; and sometimes, if not always, with a smaller pecuniary reward. His mission is the realization of the beautiful and the best. He takes the little, wayside, wild berry with all its imperfections and transforms it into a thing of marvelous beauty, surpassing in loveliness and delightful qualities the far-famed apple of the gods.

Hence, my friends, the grower of fancy strawberries is an artist and a lover of the beautiful. His fruit is a triumph of the artistic and aesthetic functions of mind. He has given the world new and improved varieties of this splendid fruit. He has broadened, deepened and strengthened the consumptive demand for it and has done more than all others towards giving the strawberry its present supremacy among small fruits.

DISCUSSION.

Discussion led by Mr. J. G. Grossman, Wolcottville.

Mr. Grossman: I think after listening to such a paper that has covered the ground so completely, it is useless for me to make any argument. I agree with him on a great many points. I agree with him especially in regard to the Warfield being a fine berry, but I did not know it was a strictly fancy berry, although it might be with hill culture. I believe the modified hill or the hill system is the only way to grow fancy berries. You can not get fancy berries in a matted row. If we are growing berries on a large scale it is too expensive to use hill culture, yet if we are growing them on a small scale, it is the best we can do.

Digitized by Google

Mr. Garretson: The hill culture was a success with me until this last year. I planted them thirty-two inches each way and tended them thoroughly. I did not have sufficient mulch last winter and the frost divided the tops and roots. I want to know how much to mulch. As to quantity, I had 325 bushels to the acre last year.

Mr. Hobbs: We should certainly mulch enough to keep the plants in the ground.

Mr. Johnson: There is much to commend and little to criticise in the paper, but if I understood the paper on one point, I will have one small criticism to make. He said the larger the better. I disagree with him. I think the larger are not so good as the medium sized berries. He puts the Brunette lower than I would put it. I would not put it first, but I would put it near the top.

Mr. Neicewander: I do not mean the monstrosity, but I mean the largest size that is consistent with the fancy berry. This, of course, is for the market and not for the table. The Brunette is perhaps the most imposing looking berry, but the flavor is not so good as others. I have tested it by different methods and find it lacks flavor.

Mr. Kingsbury: I would like to ask Mr. Neicewander's opinion in regard to planting strawberries in the fall. Some growers almost refuse to sell strawberry plants in the fall, as they think the spring is the best time, and for their own reputation they decline to sell in the fall.

Mr. Neicewander: I have not had much experience in fall planting. I have not had much success in planting in the fall. Doubtless the conditions of the soil would have something to do with it. Soil compacted by rains in winter would not be desirable for fall planting.

Mr. Teas: There are several reasons why it is not best to plant strawberries in the fall. The plant grower can not afford to dig them in the fall. If he digs them in time for the plant to get hold of the soil before winter, he destroys most of his crop of young plants. Nine times out of ten we have severe drouths in the fall that prevent plants from taking hold of the soil. I do not

Digitized by Google

believe there is one case in twenty where the planter saves himself by planting in the fall. Plants cost more in the fall than in the spring and are generally a loss to the planter.

Mr. Hobbs: We have had quite an experience in fall planting and it has always been against it. Very early spring planting has almost always been successful.

Mr. Ragan: Generally speaking, spring is the preferable time for transplanting trees as well as strawberries and small fruits. Fall planting is admissible, but spring is preferable. I endorse his description of the ideal berry even as to the size, with the qualification he gave. There is one point to which the amateur might take exception, but the practical man must admit. That is, a bushel of Ben Davis is better than no Grimes Golden.

Mr. Jesse Stevens: I believe the time has come when this Society could sit down flatly on fall planting of strawberries. I think it is a failure and should be discontinued. In regard to mulching, I have never been able to satisfy myself that straw is the thing. My experience in twenty-five years of strawberry growing is, that the best mulch, taking everything into consideration, is to take our corn fodder and run it through a threshing machine, and then as the ground freezes, mulch the strawberries with it.

Mr. Johnson: If you want to plant largely, plant in the spring, but if you want to only plant a few for domestic use, get your plants started early and plant in August and you will have a crop for the next year. If you are going to plant a great quantity, always plant in the spring. In regard to mulching, I agree with Mr. Stevens entirely.

Professor Troop: Last year I mulched exclusively with corn fodder and it gave excellent results. Don't put it on too thick.

Mr. Henry: In regard to mulching with straw, of course you get a great deal of foul stuff in the ground. The mulch depends on what you are going to do with the patch the next year. It is seldom I keep an old patch. If I have some good varieties and a pretty good crop I generally fix up a few acres of the old patch for the next year. I do that by mowing the ground and after it has laid a few days and a good breeze comes along I touch a match on the

Digitized by Google

north side and burn it clean, then I work the ground like a new patch. I grow in very narrow, matted rows. Last year we plowed and harrowed nine times. The plants came up nicely through August and September and I never had as nice berries as I had on that piece of ground. There are a few "dont's" that I want to speak about. Don't pay too much attention to highly illustrated catalogues. Don't plant berries you know nothing of. The pistillate varieties make the most money. In planting the pistillate varieties, I plant an early and a late pollenizer on opposite sides. If I am going to plant a block of Warfields, I will plant a Michel's Early on one side and perhaps a Gandy or a Lovett on the other side.

Another thing is, don't pick all your berries to sell. You always have some berries that are not fit to sell. There is where a great many growers make a mistake. If you are going to hold regular customers you can not afford to pick and sell all your berries. You must assort them and throw out some. I always have my berries picked and assorted and fixed as fancy on top as possible. I always aim to put as good berries on the bottom as on top. You will gain by it every time. As far as fancy berries are concerned, the largest berries sell provided the shape is all right.

The next was a paper on

SMALL FRUITS FOR THE FARMER.

BY WILLIAM TALBERT, ALBION.

The object of our horticultural societies is not only to advance our financial interest, but to improve our physical, social and moral faculties. Whatever tends to develop the faculties is helpful in building the home. Small fruits are helpful along all these lines. They add health to the body, peace and contentment to the mind, and happiness to the soul. Of all homes, the farmer's ought to abound in all those—small fruits, health of body, peace of mind and joy of soul.

But in passing through the country we notice a great deficiency along the line of small fruit. Many farmers say they have not time to bother with it; that they can buy what they want cheaper than to raise it. But I have observed that those who do not raise it do not have it. Aside from its healthfulness, it is a great luxury. What a pleasure it is to go out and gather the fresh ripe fruit from your own vines and bushes! First, comes the beautiful and luscious strawberry. Oh, delighted are the chil-

Digitized by Google

dren! Then comes the healthful and appetizing currant and gooseberry. Then follows the red and black raspberry in their order, winding up with the blackberry, giving us fresh fruit for about three months in succession. Then let every farmer with all others who have space enough prepare a fruit garden for the home. If it were convenient I would arrange it something after the following order:

A strip of ground ten rods long and four rods wide planted as follows: First, three rows of strawberries four feet apart. Three rows for vegetables same distance apart to alternate with strawberries every two or three years. One row for currants and gooseberries, one row for red raspberries, two rows for black raspberries, and one row for blackberries.

As to varieties of fruit, I would advise something like the following: Strawberries, namely, Haverland, Warfield and Brandywine, with enough Lovett to fertilize the Haverland and Warfield; currants, Fay's prolific; gooseberry, Downing; red raspberry, Turner, Cuthbert, or Shaffer's Colossal; black raspberry, Souhegan and Ohio; blackberries, Snyder and Taylor. With all these added, the home wil be pleasant and attractive and the children will grow up healthy, happy and contented.

Following this was a paper on

THE EXHIBITION APPLE.

BY JOE A. BURTON, ORLEANS.

The exhibition apple is a very useful adjunct of society. It pleases, advertises and brings reward to the exhibitor. It gives pleasure to, entertains and instructs the observer. At our fairs there is nothing else that entertains so many visitors as the fruit tables, and the chief feature of these is the apple.

The direct object of the exhibitor is to beat—get the premium. To do this his apples must fulfill the requirements of the premium giver to a larger degree than those of the other fellow, whether these requirements be in accordance with common sense or not. Educationally, apples are exhibited to induce people to grow fine apples. Then this apple should approach perfection as near as possible. The mere fact that it is better than some other apple is a poor recommendation. Both may be and very often are, bad. Very often at our State Fair we see apples on exhibition that are wormy, scabby and decaying; and what is worse, we see these apples ornamented with a blue ribbon. They would not grade No. 1 in a market barrel. In selecting your apples for exhibition be governed by the following rules:

1. Let them be free from blemishes.
2. Let them be properly colored.
3. Let them be symmetrical.

Digitized by Google

4. As a climax, be sure they have plenty of size for their kind. But under present rulings, better be careful about this latter point.

Our State Fair, through the instructions of our Horticultural Society, has adopted some arbitrary rules that are more learned than wise; rules that are calculated to detract from the growing and exhibiting of the finest apples. They say a medium, average size apple shall outrank a larger one. John Smith manures, trims, sprays, cultivates and thins that he may have not only smooth, perfect apples, but large ones. Poor John! Your big apples may please yourself, your customers and even bring forth eulogies from the awarding committee, but you can't get a premium.

Now I give this statement once for all, other things being equal, the largest apple should take first award.

Again, we say it must have the stem on. Isn't this an insult when we let the horse pass all right without a tail? The horse's tail is a very useful appendage, but the stem of an apple is of no economical use when parted from the tree. Sprayed apples very often have a russet skin. This should not be considered a defect in exhibitions. It is a fact, though not generally known, that an apple with a russet skin is of better quality than one of the same variety with a smooth skin.

Now, in conclusion, in view of the above statements, would it not be proper to appoint a committee to revise the rules on exhibits and report at the winter meeting.

DISCUSSION.

Discussion led by W. B. Flick, Lawrence.

Mr. Flick: This subject opens a large field for study, covering the whole scheme of exhibitions and agricultural fairs. It is a live and timely subject and deserves our closest consideration. It may begin at the purpose of the exhibition and end with the disposal of the proceeds and remainings. The primary purpose of the exhibition is education. It seeks to inform the general public with regard to varieties, their adaptability to certain regions, the manner of culture, their market value, their value for home use, etc. Fair managers are prone to lose sight of the real or legitimate object sought. They too often are led to pander to the lower tastes of the community and so prepare their lists that they emphasize the ideas of novelty, monstrosity or mere gaudiness. How often does the owner or exhibitor of the fine herd of cattle or horses find himself entirely overshadowed by the three-legged colt or the double-headed calf, or the fruit grower with the "missing link," or the

Digitized by Google

arrogant and egotistical seedling. I would not find fault with fair managers for doing all they can to draw a crowd in a legitimate manner, but do protest against the emphasis of novelties to the exclusion of the legitimate show.

In the growing and selection of specimens no one has as much power as the maker of the lists except, perhaps, the awarding committee. Whatever points these encourage in their lists and awards will surely be seen in the exhibits. Therefore the list makers should be sure to emphasize the legitimate points. I have never taken any special pains or tried any experiments to grow fruit especially for exhibition. I bring all the resources I can command to grow good marketable fruit and select from these the specimens for exhibition. These should be selected with regard to the points of excellence as given by the premium lists, among the best of which is that issued by our State Board of Agriculture. In making the awards, the committee should give the premiums to the fruit on exhibition and should not encourage the pernicious habit of passing the awards around so that each exhibitor shall have something.

Mr. Morgan: In this part of the country we have come to the conclusion that we can not raise good fruit to exhibit without spraying. I was in hopes that the subject would be fully ventilated. The time has come when we must spray our trees or have no fruit. The most of the fruit on exhibition will show the effects of spraying and some shows that it has not been sprayed. I spray before the bloom, during the bloom and afterward several times. I was traveling in the southern part of Hendricks County not long ago and I came to a new place where the soil was good and rich and saw gardens and orchards where the insects had not come. As soon as I got near it I felt like I was in another world. I have no doubt, however, but that in a year or two the bugs will find it.

It was moved, seconded and carried that we appoint a committee to revise the rules under which we exhibit horticultural products at the State Fair, to report at the annual meeting.

Professor Troop: I heard Mr. Burton say that the apple stem had no economic value after it had parted from the tree. When the stem is pulled out of the apple, the apple will not keep as long

Digitized by Google

as when the stem is intact. In case of varieties not well known, the stem frequently aids in designating the variety. I claim that the stem should remain in the list of points.

Mrs. Stevens: I don't want the Horticultural Society to hesitate about asking the State Board for anything. They don't know what this Society wants, and what we want is to see that we have some horticulturist who does know, and will say so.

Mr. Johnson: I, with others, was appointed at our last meeting to revise the premium list and go before the State Board. We did so. I took the list to the Secretary and the next thing I knew of the matter he wrote me that he had lost the list and wanted me to make out another. Of course I had to draw on my memory. I did the best I could, but it was imperfect. I went before the State Board and they granted everything I asked. Another thing: I am glad Mr. Morgan suggested spraying. I met a man who is traveling, and he said, "You horticulturists are always having meetings, etc., but we don't have as good fruit as we used to have." I said I thought it was lack of spraying as much as anything. I think this is the most important thing we have to consider.

Mr. Talbert: I would like this subject to be discussed now. I consider it one of the most important subjects that can be discussed. I want to call attention to the suggestion of Mr. Kingsbury of last year, that of getting some young men to study the subject and become professionals in that work. To farmers in general it is too much of a task to fix up and do the work.

Mr. Hobbs: We will not spray before next spring and before that comes our winter meeting, and I will insist that that subject be brought before the meeting. I suggest that we lay it over now, and that some one be appointed to bring the matter before the winter meeting.

The following committee was appointed on the revision of the rules under which we exhibit products at the State Fair:

J. A. Burton, W. B. Flick, Sylvester Johnson.

Then followed a paper—

Digitized by Google

SOME PHASES OF HORTICULTURE AS SEEN IN A TOUR AROUND THE WORLD.

BY J. B. BURRIS, CLOVERDALE.

It would be an unwarrantable act to inflict upon this society a paper proportionate in length to the subject. Since the horticulture of almost every country is a large subject in itself, I can but give hasty glimpses of what was in many instances imperfectly seen, when horticultural phases were ofttimes relegated to more interesting features of sight seeing in a world's tour.

There are few regions on the globe where one would at least expect anything pertaining to horticulture, as in Alaska. When this country was purchased by President Johnson, the dominant party, by way of ridicule, derisively called it Andy Johnson's strawberry patch. Yet along the coast of the many islands adjoining, vegetation grows luxuriantly and during the month of August we found a wonderful crop of salmon berries. The canes grow throughout the forests in profusion and nearly always produce a crop upon which the bears and Indians feast and both grow fat. The scant population does not warrant a market and tons ripen and waste annually. The canes and berries resemble, to a certain extent, our red raspberry, though shaped like a blackberry.

The horticulture of Hawaii is not nearly so extensive as its floriculture, but the former is susceptible of great development.

One of the most noticeable features of the plant life around Honolulu is the universal growth of Taro, a plant, similar in appearance to the calladium, but having a large bulbous root that is extensively used as food for the natives, the Chinese, and Japanese and some whites. Of this root the famous native dish of poy is largely composed.

Japan is famous for two fruits, plums and persimmons. The latter were in their prime during the month of my visit—October, and were frequently had at the table and cheaply obtained in the markets. The cherry seems to be cultivated in Japan more for its flowers than fruit, and low rows of large trees line the canal banks everywhere, and when in full blossom the whole population turns out en masse for a gala day. The chrysanthemums, for which Japan is famous, were a disappointment. The display during the month when they are at their best was not especially good, for larger and more beautiful specimens are shown at our autumn floral exhibitions.

As we traveled toward the equator in the Orient the vegetation and variety of fruits rapidly increased. Many things new are noted but as a rule the dweller in a temperate clime finds little to admire in these newly-made acquaintances. At Singapore, the metropolis of the Straits Settle-

Digitized by Google

ments, the wealth and vanity is wonderful. Besides it is a never ending supply. The floral array is astonishing. Little effort is made to use the fruits except in a raw state.

The English capital has been employed in canning and preserving marmalades. At no place in the Orient is there anything like an organized effort in planting, growing and marketing. The small business is in the hands of natives whose methods are crude and who want the energy that characterizes the dweller in less enervating climes.

Ceylon was once famous for its large plantations of coffee and cinnamon, but these have ceased to be a commercial product and their places taken by great areas of tea. Tropical fruit of all kinds are had in abundance, but no attention given to their cultivation. It is a universal fact, that where nature has been so lavish man uses least effort to improve what has been given him. At Kandy, in the interior of Ceylon, is a tropical garden maintained at government expense that is more varied in its collection than any we have ever seen. Nearly 200 specimens of palms alone are represented. The teeming, congested, starving millions of India, consume but little fruit. Not even in China is the fruit ration so small and inadequate is in India. The mango, tamarind, and species of palm that produce nuts are common, but their product is used only in a limited way.

In Egypt and Palestine, the same disregard is paid to things horticultural. When in Cairo, I attended the first official agricultural fair ever held in the country and any township in the State could produce a better one, though the valley of the Nile has been farmed since Bible days.

Near Jappa, the principal port of Palestine, a German colony are unsuccessfully growing the orange, and will soon add grapes. The only fruit given attention about the sterile regions of Jerusalem is the olive, and the groves are small and neglected. Its extreme hardiness finds favor with such careless cultivators.

Syria is in notable contrast to other portions of Turkey. The whole country about Damascus appears like one vast garden and orchard. Nearly all the tropical, semi-tropical fruits and those known to a temperate region are produced. The country is splendidly watered by streams running down from the Lebanon hills. Much attention is given to silk worm culture and extensive groves of mulberry trees are noted. The trees are cut back each year and only leaves grown on new branches are used.

About Constantinople there are many fine orchards of tropical and semi-tropical fruits, but they are usually the pleasure grounds of the wealthy Turks and are not cultivated for profit. Whatever the Turk touches he blights until he has well merited the title of renegrade nation.

The south of Africa has long been famous for its lemons, the chief horticultural product. One is continually treated to surprises and wonders

Digitized by Google

at the great amount of labor that has been expended to terrace the steep and barren hillsides, making retaining walls and then bringing earth to support the trees. No more beautiful sight could be imagined than these once rocked cliffs, covered with yellow fruit. I doubt if there is a grander drive in all the world than around the bay of Naples to Salerno. All Italy is steeped in wine, for the grape is cultivated in nearly all portions except the extreme south.

Much of Spain is too cold to grow fruits and the Spaniard is to indolent to exert himself to produce anything else. In the region about Seville, the heart of Moorish Spain, the orange grows to perfection. Grapes are cultivated and wine of a peculiar taste produced. To the southward along the coast Malaga grapes are produced in quantities and find their way to our markets.

Southern France is the garden of Europe. Nowhere else in all the continent does one see so much neatness and evidence of thrift. Not only does the French peasant have an eye to business, but to beauty as well. His orchards and vineyards show evidence of good tillage and careful attention. No large areas are devoted to orchards, but the aggregate amount must be enormous. The grape still outranks all else in proportion, for French wines outrank all others in purity and excellence. If France is the garden of Europe, Switzerland is its playground. Where nature is in its wildest mood man has tried to obtain a foothold and planted the steep hillsides with vines. None can help admiring the plucky Swiss, a combination of Italian, French and German.

In Germany and Austria the same climatic conditions exist as in our own State. Every available bit of ground suitable for cultivation is used. One sees long rows of apple trees planted along the unfenced roadways. Upon inquiry I found that these fruit trees were the property of the persons owning the land adjoining the road. The practice is one that in time will obtain here, but at present with our vast areas suitable for cultivation we are not so restricted. In years to come a teeming population will demand the utilization of all our vast domain.

Russia and the Scandinavian peninsula are, for the most part, restricted in fruit growing by the severity of their climate. The sands of Holland and Belgium are not adapted to fruits. The inhabitants of the former are largely engaged in dairying and growing bulbs. The latter have reached an advancement in agriculture perhaps unequaled by any other of Europe. In England one rarely sees a large apple orchard, and I don't recall seeing any peach trees. The best fruit regions, I was told, was the north central region. No doubt the excessive moisture of the south coast and Scotland is detrimental to fruit growing.

Digitized by Google

After admiring the Japanese gardener the tasteful Frenchman, among his vines or the patient plodding Austrian, one can come to only this conclusion. To succeed, we must exercise greater care; care in selection; care in cultivation; care in our war on insect pests. With worn soils, few modern tools and the most laborious methods they succeed while we often times fail.

DISCUSSION.

Mr. Hale: Were the apples similar to ours?

Mr. Burris: I think those of Austria are better than those grown here. At least in appearance. In England, most of the apples consumed are foreign grown.

Mr. Teas: I think the apples grown in France, Germany and Austria are grown more for cider to mix with their wines than anything else.

Mr. Kingsbury: What about Russia?

Mr. Burris: Russia is the most disagreeable country to travel in. With the exception of Turkey it is the only country in the world that demands a passport every time you go in or out of a city. You have to go to the American Consul and get a passport. When you arrive at a city you are taken in charge by the police, and you have to identify yourself, tell them when you arrived, how long you expect to stay, when you will leave. I was disgusted with it.

Committee on awards reported, and the report was adopted.

REPORT OF AWARDING COMMITTEE.

	1st	*2d*	*3d*
Plate Maiden Blush—			
Walter Ratliff	$0 75	....	....
John Morgan	....	$0 50	....
Plate Wealthy—			
Walter Ratliff	$0 75	....	....
Mrs. De Vilbiss	....	$0 50	....
Plate Benoni—			
Walter Ratliff	$0 75	....	....
Plate Chanango—			
H. J. Hale	$0 75	....	....
Plate August Variety—			
Walter Ratliff	$0 75	....	....
H. J. Hale	....	$0 50	....

Digitized by Google

	1st	2d	3d
Plate Duchess—			
D. M. Carter	$0 75	....	....
Isaac B. Jones	....	$0 50	....
Best Display of Apples—			
Walter Ratliff	$3 00	....	....
Mrs. De Vilbiss	....	$2 00	....
Isaac B. Jones	....	....	$1 00
Best Display Pears—			
Walter Ratliff	$3 00	....	....
D. M. Carter	....	$2 00	....
Mrs. De Vilbiss	....	....	$1 00
Best Plate August Variety Pears—			
Walter Ratliff	$0 75	....	....
W. B. Flick	....	$0 50	....
Best Display Peaches—			
Mrs. De Vilbiss	$3 00	....	....
Best Plate Freestones—			
L. C. Kline	$0 75	....	....
J. C. Grossman	....	$0 50	....
Best Display Plums—			
L. C. Kline	$3 00	....	....
D. M. Carter	....	$2 00	....
Mrs. De Vilbiss	....	....	$1 00
Best Plate August Variety Plums—			
L. C. Kline	$0 75	....	....
D. M. Carter	....	$0 50	....
L. C. Kline	....	....	$0 25
Best Display Plants and Flowers—			
Mrs. W. B. Flick	$2 00	....	....
Mrs. H. J. Hale	....	....	$1 00
Best Display Vegetables—			
E. B. Davis	$3 00	....	....

E. Y. TEAS,
H. W. HENRY,
MRS. W. W. STEVENS,
Committee.

The Committee on Resolutions reported as follows:

Resolved, That we, the members of the Indiana Horticultural Society, thank the Friends for the use of the church and this beautiful grove, a fitting place to hold a horticultural meeting. The placing of a church in

Digitized by Google

large grounds and the planting of a grove of trees around it like nature is a novel idea and should be an inspiration to every member present to not cease working until every rural church, schoolhouse and country home has its share of ground, trees and beauty.

Resolved, That we thank the local Society and people of Plainfield for their hospitality and generosity in entertaining us and making our stay in their village pleasant and one long to be remembered.

Resolved, That we thank Professor Charlton for the pleasure of a visit to the Reform School, and his kindness in answering questions and showing us around the beautiful home for the unfortunate boys of our State.

Whereas, Indiana is a great agricultural State and is destined to become a greater one. The density of its population will make it a country of small farms and intense cultivation; therefore,

Resolved, That we ask the Legislature for the necessary appropriation to make Purdue University one of the first and best agricultural colleges in the land, and that we recommend greater facilities for the education of the farmers' daughters.

Owing to the constantly increasing depredations of insects and the impossibility of producing perfect fruit on that account,

Resolved, That we recommend the profession of spraying to our young farmers and fruit growers, as one that is destined to be a profitable one when once established.

J. G. KINGSBURY,
NAOMI DeVILBISS,
MRS. J. TROOP,
Committee.

Report of the committee was accepted.

Mr. W. H. Ragan was called on to make a few remarks, and spoke as follows:

I am not in very good condition to speak, but I feel honored by this invitation. I have traveled nearly 1,000 miles to be with you. I was anxious to be with you this time. The meeting with old friends and comrades and the ozone in this atmosphere has revived me after the heat of Washington. I am glad to be with you after sixteen months absence. I was called there, as I supposed, temporarily, but I have been held and reappointed and advanced in pay once or twice, and I am now under obligation to return as soon as my health will justify.

I will say a few words as to what I am doing there. The Government had done but little directly in the interest of pomology. The establishing

Digitized by Google

of a division of pomology probably emanated from an adjoining room to mine at New Orleans in 1885. It resulted in Mr. Coleman being appointed Secretary of Agriculture and the establishment of this new division. The growth has been slow and the development has been by approaches, as there was no organization and no regular system of work. Colonel Brackett is now in Paris in charge of the pomological exhibit at the World's Fair. The work I went there to do was to make a revision of the catalogue of fruits. I supposed that after that I would return home, but my work has been somewhat general since that. I have had considerable to do with gathering the exhibit for Paris. In the meantime the permanent work I have been doing is a card list or index of fruit on which is the name of the leading variety. The policy of the division is the simplification of our nomenclature. First the agreement of the name. I think the green gage plum has forty-nine synonyms. Our policy is to simplify this and adopt one name under which the fruit should be known everywhere. These cards are all arranged in drawers in alphabetical order so you can easily find them. I have already had 2,000 names of plums, and think we will reach that number of grapes. An inquiry at the division of pomology can be answered in a few moments. It is a permanent work and will result in the simplification and systematic understanding of the fruit nomenclature and it is contemplated to publish this in form to be distributed. The most recent publication is one on the apple by Colonel Brackett, and is known as Bulletin No. 113. If you wish for a catalogue of fruits you can get it by asking for Bulletin No. 8.

After adjournment, many of the members of the Society availed themselves of the invitation extended to them by Messrs. Albertson and Hobbs to visit their nurseries at Bridgeport, which is five miles east of Plainfield. Here they were shown through the two hundred acres of nursery stock, and given something of an idea of the extent of and system which prevails in a modern nursery.

Digitized by Google

Digitized by Google

PROCEEDINGS

OF THE

FORTIETH ANNUAL MEETING

OF THE

Indiana Horticultural Society

HELD AT THE

State House, Indianapolis, Indiana,

December 18, 19 and 20, 1900.

The fortieth annual meeting of the Indiana State Horticultural Society met in the rooms of the State Board of Agriculture in the State House, Tuesday, December 18, at 1:30 o'clock. The meeting was called to order by the President, C. M. Hobbs, who delivered the President's address, as follows:

We are met in the fortieth annual meeting of this Society. Another year has passed with its successes and failures, and its lessons for the future. After the past year's experiences and observations, I am fully convinced that if we are to succeed in our calling we shall have to more intelligently and energetically apply the principles of modern science in our operations. We shall have, in the light of science, to study the nature of soils as to plant food and the adaptation of varieties to soils and situations.

We must learn that it is not enough to simply procure and plant the tree, but that it must have intelligent and timely care. With our increas-

Digitized by Google

ing dry, hot summers, we are compelled to study and apply the principles of the conservation of moisture. With the increasing destruction of insects and fungus diseases, we are compelled to know more of insect life and parasitic growth and the most successful methods of combating them. The sluggard can not succeed in horticulture; success in the future can only follow intelligent, timely, energetic effort.

If, by selecting varieties adapted to climate, soil and situation, by supplying all the plant food required, and by thorough cultivation, we secure the proper mechanical condition of soil and conservation of moisture; if, by the timely and proper use of the sprayer we preserve tree and fruit in healthful condition, and by properly thinning the fruit preserve the highest possible vital energy of tree and plant, we shall generally succeed. If these conditions were properly met, I am confident that our State would produce hundreds of bushels of fruit where one is now produced.

We have a few illustrations in our own State of the benefits derived from the application of these principles; but the most striking example of intelligent, successful fruit growing that has come under my observation is that of Mr. Morrill, of Benton Harbor, Mich. Mr. Morrill not only has up-to-date ideas about fruit growing, but he puts them in practice. By thorough cultivation, fertilizing, pruning, spraying and thinning the fruit he is able to secure the ideal tree; or, in other words, to build up and maintain the highest possible vital energy of the trees.

Two years ago, following the severe winter, the wisdom of his methods was clearly proven. Peach trees that were cared for in the usual way were severely injured by the winter, and many were killed outright. There were few peaches anywhere that year. Mr. Morrill's trees, on account of their superior vitality, came through the severe winter with little or no injury, bore a full crop of fine fruit that brought fancy prices on account of the general shortage in the crop.

Mr. Morrill finds it pays him well to spare no pains or expense in producing the best possible tree. I have used this illustration to show particularly that if we are to succeed in fruit growing in Indiana we shall have to employ different methods from those of the past, we shall have to invest more in the care of the trees and plants.

We hope to be able to show in the experimental orchard of this Society some of the results of the most approved methods of orcharding. We also expect to be able, through hybridizing and selection, to make some valuable additions to our list of good apples. We have every reason to believe that this undertaking will, in a few years, result in great benefit to the State.

This Society has a great work before it through its meetings, published proceedings, local organizations, etc., in disseminating needed in-

Digitized by Google

formation and in building up the horticultural interests of the State. Neighboring States are advancing much more rapidly along these lines, and it is to be hoped that the coming Legislature will properly appreciate the great importance of this work to the State and make an appropriation commensurate with its importance.

The State of New York has, in recent years, made very liberal appropriations, and has by this means greatly improved the horticultural conditions of the State. The results have been so satisfactory that Professor Bailey says that they do not now have to ask for an appropriation, but it is one that the Legislature seems glad to give. It is clearly to the interest of the State to look carefully after the State's productive resources, as these are its chief sources of wealth.

The San Jose Scale.—This dangerous pest has been found in seventeen counties of the State. The worst infested localities are in the southwest part of Indianapolis, and in Vanderburgh County near Evansville. Twenty-five or thirty cases have been found in Vanderburgh County, and there are probably as many in this city. This Society did a good work for the State when it framed and secured the passage of a noxious insect law; and Governor Mount did the State a good service when he appointed Professor Troop State Entomologist to enforce the law.

With the aid of the law, the entomologist has been able to stamp out the San Jose scale in five counties of the State, and in a number of localities in other counties. The entomologist finds he can not get over the State and do the work as it should be done with the present appropriation of $1,000; he thinks with $1,500 the work could be quite thoroughly done. It is to be hoped the coming Legislature will increase the appropriation to $1,500.

So far as the scale is concerned, we feel that it is well under control, and that by watchfulness, prompt and vigorous action, we will in time be able to rid the State of this dangerous enemy to trees and plants. The law has been of great assistance in suppressing the canker worm, black knots and other enemies of trees and plant.

I would like again to call the attention of this Society to the importance of the subject of forestry in our State. We should continue to keep this subject before the people and urge its importance until all the waste places shall be made glad with stately trees, running brooks and singing birds.

In the past few years we have so frequently been shocked at the wanton butchery in the trimming of shade trees that we feel it our duty to cry out against this abuse of the noble trees. The soft maple is the most frequent sufferer probably, but no varieties are spared. This butcher begins his work with but one idea in his head, and that is to lop off all the

Digitized by Google

branches just as near to the body of the tree as possible, regardless of the size of the tree.

In a certain village in this State, there was a row of fine soft maples, 16 to 18 inches in diameter, and with a fine spread of branches. In the month of August, the owner had all the branches cut off within four to six feet of the body of the trees. As a result of removing nearly all the foliage at this time of year, the trees were greatly shocked and came near dying; all the stubs of branches left, sun-scalded from exposure to the direct rays of the sun, and as a result these branches are dead one-half to two-thirds round.

Another illustration. Three or four large soft maples lined the sidewalk in front of the residence, with a fine specimen of native elm at the end of the row. I never passed this place, but I admired this fine elm, stretching out its long sinewy branches as though bent on protecting everything within the possible reach of its generous arms.

One day, to my surprise and pain, I saw the tree butcher had gotten in his work. Those trees that had added so much to the attractiveness and comfort of the place had been reduced to mere stubs, and the proprietor has had the pleasure of basking in uninterrupted sunshine, and will continue to enjoy this privilege for some time to come.

Soft, brash-wooded trees, like the soft or silver maple, should have their branches shortened in some every year or when growing rapidly, in order to give sturdiness to the limbs and compactness to the top. If this is done every two or three years for a few years, the individuality of the tree can be preserved to a great extent, it will always be sufficiently compact and symmetrical in top, and strong enough to withstand the sleet and storms. By this method no great amount of wood is removed at any time, the tree is not shocked by severe pruning, and is more likely to be kept in healthy, vigorous growth.

If the maple family of trees is trimmed about the time the buds burst into foliage, there will be no bleeding or loss of sap. Our elms, hard maples, ash, lynn, liquid amber, etc., rarely need any pruning if properly shaped. Let us do some missionary work along the line of tree planting, and see if we can not improve the present conditions.

I trust that we will make this the most interesting and profitable meeting we have ever held.

The report of the Secretary, James Troop, was made as follows:

Digitized by Google

REPORT OF THE SECRETARY.

FINANCIAL STATEMENT.

The following is a statement of the financial transactions for the fiscal year ending October 31, 1900. With this is submitted a list of vouchers and a summary of all moneys collected and paid into the hands of the Treasurer, with warrants drawn on that officer for the corresponding period.

Summary of the Receipts for the Year Ending October 31, 1900.

Balance due from Secretary, 1899	$12 39
Received for membership fees	80 50
Balance due the Secretary October 31, 1900	6 95
Total	$99 84

Summary of Credits.

Paid for stationery and printing	$19 75
Paid for freight and express	13 90
Paid for postage and postal cards	43 80
Paid for traveling expenses	8 50
Paid for telegrams	2 64
Paid for wrapping paper for Buffalo exhibits	11 25
Total	$99 84

Account with the Treasurer.

To balance on hand November 1, 1899	$1,165 10
To cash received from the Secretary as membership fees	80 50
To cash received from Secretary, balance from last year	12 39
Total	$1,257 99
He has paid warrants 332 to 362, inclusive	906 17
Balance in the treasury November 1, 1900	$351 82

Digitized by Google

Following is a list of warrants drawn on the Treasurer for the fiscal year ending October 31, 1900:

1900.			
Jan.	3.	Warrant No. 332, Miss Flora Chizum, stenographer....	$20 00
"	4.	Warrant No. 333, S. Johnson, to pay premiums.....	65 50
"	4.	Warrant No. 334, Joe A. Burton, expenses at Board meeting	7 50
"	4.	Warrant No. 335, R. Morrill, expenses and services at annual meeting	12 00
"	4.	Warrant No. 336, Mrs. W. W. Stevens, expenses at Board meeting	4 95
"	4.	Warrant No. 337, Snead Thomas, expenses at Board meeting	8 25
"	4.	Warrant No. 338, E. Y. Teas, services as entry clerk....	5 00
"	4.	Warrant No. 339, E. Y. Teas, expenses attending Board meeting	6 25
"	4.	Warrant No. 340, J. Troop, hotel and other expenses as Secretary	14 00
"	4.	Warrant No. 341, C. M. Hobbs, expenses at Board meeting	5 00
"	4.	Warrant No. 342, J. C. Stevens, expenses at Board meeting	7 85
"	4.	Warrant No. 343, S. Johnson, services as Treasurer....	10 00
"	4.	Warrant No. 344, C. M. Hobbs, services as President...	10 00
Apr.	6.	Warrant No. 345, J. Troop, Secretary, on salary.....	150 00
May	17.	Warrant No. 346, Wm. B. Burford, printing annual report	240 73
Aug.	17.	Warrant No. 347, J. C. Grossman, expense at Board meeting	11 00
"	17.	Warrant No. 348, Geo. P. Campbell, expense at Board meeting	4 25
"	17.	Warrant No. 349, Mrs. W. W. Stevens, expense at Board meeting	10 50
"	17.	Warrant No. 350, L. B. Custer, expense at Board meeting	6 50
"	17.	Warrant No. 351, E. Y. Teas, expense at Board meeting	4 75
"	17.	Warrant No. 352, Amos Garretson, expense at Board meeting	3 50
"	17.	Warrant No. 353, S. Johnson, expense as Treasurer....	1 50
"	17.	Warrant No. 354, J. C. Stevens, expense at Board meeting	10 00

Digitized by Google

1900.		
Aug. 17.	Warrant No. 355, J. Troop, expense at Board meeting..	$9 25
" 17.	Warrant No. 356, Flora Chizum, stenographer.....	15 00
" 17.	Warrant No. 357, Joe A. Burton, expenses as Superintendent of experimental orchard.....	20 50
" 17.	Warrant No. 358, C. M. Hobbs, expense at Board meeting	2 00
" 17.	Warrant No. 359, J. Troop, balance of salary as Secretary	100 00
" 17.	Warrant No. 360, S. Johnson, to pay premiums.....	38 00
Sept. 20.	Warrant No. 361, S. Johnson, to pay expense of Executive Committee	9 50
Oct. 31.	Warrant No. 362, J. Troop, Secretary, for office expenses	92 89
	Total	$906 17
	Balance in treasury October 31, 1900.....	351 82

Supplemental Report.

To amount paid out between November 1 and December 31, 1900, including premiums paid and expenses of officers and speakers from other States at annual meeting.....	$273 35
Balance in the treasury December 31, 1900.....	$78 47

The report of the Treasurer, Sylvester Johnson of Irvington, then followed:

TREASURER'S REPORT.

Report of the Treasurer of the Indiana Horticultural Society for the fiscal year ending October 31, 1900:

Debits.

October 31, 1899.	Balance in treasury at last report.....	$1,165 10
October 31, 1900.	Received from Secretary membership fees of 1899	12 39
October 31, 1900.	Received from Secretary membership fees of 1900	80 50
	Total	$1,257 99

Digitized by Google

Credits.

October 31, 1900.	Paid on warrants Nos. 332 to 362, inclusive...	$906 17
October 31, 1900.	Balance in treasury	351 82
Total		$1,257 99

Respectfully submitted,

SYLVESTER JOHNSON,

Treasurer.

Supplemental Report December 31, 1900.

Balance on hand November 1, 1900.....	$351 82
Paid warrants Nos. 1 to 18, inclusive.....	273 35
Balance on hand December 31, 1900.....	$78 47

SYLVESTER JOHNSON,

Treasurer.

On motion, the report of the Secretary and the report of the Treasurer were each referred to the Committee on Finance.

REPORT OF THE SUPERINTENDENT OF THE EXPERIMENTAL ORCHARD.

BY JOE A. BURTON, ORLEANS.

The growth of trees planted in the spring of 1899 has been very fine. Their cultivation was with the spading harrow. Three cultivations were given, ending the middle of June. At last cultivation one bushel of cow peas per acre were sown. These made a fine yield, both of stalk and pod. A part were mown for hay and the rest left standing. The attempt to hog down has failed up to the present.

Four trees of top workers were grafted with scions from North Carolina bearing the following names: "Hoover," "Yellow Pippin," "Never Fail" and "Nansemon;" one tree with "Obediah," from John Morgan, Danville; one tree with "Genet" and one with "Rambo" from trees bearing very diverse specimens, to test the variations of varieties. Incidental to the orchard, we have grafted different varieties on a wild crab not in the orchard, to test the influence of the tree sap on the fruit. It is proposed to grow these apples without any leaves of their own.

In crop pollenizing we have for two years failed to find pollen on Winesap. Large sections of blossoms enclosed by cheesecloth set no fruit. We infer that this was not on account of absence of insects, as "Rome Beauty" enclosed in paper sacks set fruit all right.

Digitized by Google

We failed to secure any pedigreed seeds this year. On account of sick neighbors we could not cross pollenize many. Prof. R. H. Troth, of Orleans, kindly assisted me one day. For various reasons our labor was lost. This is a very tedious operation and requires much patience. We have saved a few selected seeds; one lot from a large white apple, name unknown, grown in North Carolina. When about half decayed this apple weighed 21 ounces and was of fair quality.

Apple seeds planted in 1900, 9,000; resulting scions, 989; height of scions, 1 to 48 inches; variety germinating largest per cent., Winesap; variety making largest growth, Ben Davis. Ben Davis maintains its fine root system. Winesap its scant root system. Number of pedigreed trees, three. They are Genet pollenated by Ben Davis.

We have selected for top grafting the most promising of—

Ben Davis	12
Rome Beauty	14
Winesap	19
Grimes	2
Salome	2

Expenses for the year:

Cow peas (10 bushels)	$17 00
Grubbing stumps	3 50

Things badly needed for the orchard:

1. Rabbit-proof fence.
2. Zinc labels.
3. Pamunkey phosphate to prevent root rot.

DISCUSSION.

The President: What do you know about the efficacy of phosphate as a preventive of root rot?

Mr. Burton: I couldn't say positively it will prevent it. I put some phosphate around the root of a tree about the middle of the summer. The leaves were getting green on that tree, and where the roots were not already dead, the root healed up. The next season Professor Huston furnished me about one hundred and fifty pounds. I placed that around a number of Grimes trees. I examined a large part of these and found, as far as I examined, they were all healed up but one tree. These are indications which are pretty strong. Those trees have not died, but got well and are growing nicely now.

Digitized by Google

The President: The strong probabilities are that it is a fungi, and that you didn't get all these effects simply from the application of the plant food. Where the ground is strong enough the trees will grow thrifty enough.

Mr. Burton: Where I applied it to trees to see what effect it would have on the fruit, I couldn't see any effect. I think it has its effect on the fungi.

Mr. Henby: I would like to know if this is a difficulty that is general in the State—if it is a common disease in orchards? We are strangers to anything of the kind in our neighborhood. I never heard of anything of the kind this side of the Illinois State line before.

The President: Some trees are particularly susceptible to root rot, and Grimes is particularly so. In the southern part of the State they have quite a good deal of root rot. Some localities are worse than others.

Mr. Thomas of Grant County: Last week we had our Annual Farmers' Institute at Marion, and there was a gentleman from Fairmount, twelve miles south of Marion, who called my attention to it. He said in his orchards it was very bad, and he asked me if I knew anything about it or any remedy, and I told him I had heard of it, but as to any remedy I knew nothing about it at all. I was driving a few days ago in the northwest part of our county, and I saw many apple trees probably twenty years old which showed they had rotted off almost to the top of the ground and had fallen over. I said at the time that those trees were affected by root rot. I know nothing further than what I have learned or observed in this way.

Mr. Reed of Vincennes: We are troubled about Vincennes to some extent, but not very bad, with root rot. I was in Missouri week before last and they have it very bad there; and Prof. Herrman Von Schrenk, of the Missouri Botanical Garden, gave quite an interesting lecture, and showed specimens which were badly affected, and said that trees had died in orchards there after being planted four or five years, and he did not seem to know any remedy. There was a man by the name of Wilkinson somewhere

Digitized by Google

along the Mississippi River that experimented for the last two or three years with concentrated lye. He has been using it quite extensively, getting it by the ton. I think he used three tons last season, and his plan was to clean away around the tree and pour a strong solution of this concentrated lye around the roots, and where he has done this the trees have improved in growth and it has seemed to stop the ravages of the root rot.

The President: It has always been my theory that some sort of potash ought to arrest it. I know that Professor Huston is looking after this matter. I am glad to hear the report Mr. Burton makes with reference to it.

Mr. Henby: Are all classes of fruit trees affected?

Mr. Burton: In my orchard it affected the Genets and Winesaps.

Mr. Henby: How about cherries, pears and plums?

Mr. Burton: I couldn't say. I have not planted any pear trees where apple trees grew. I have planted them eight feet and three inches on each side. Last summer I lost two or three pear trees and they died in full leaf. I don't know what was the matter. It affects all kinds of apples. It has no respect for the leaf of the tree and it affects the thrifty tree as well as the weak. I used a carload of ashes at your suggestion, Mr. President, and there have not a great many died where we applied that, but some have. I have shown apples and got premiums on them at this Society and at the State Fair that were off of trees that died and rotted off before cold weather.

Mr. Davis: I would like to ask Mr. Burton if the cow peas are sufficient protection for the ground in winter?

Mr. Burton: I would suggest that if a gentleman would walk through them he would think they were enough for protection during the winter. We don't try to mow them very close. They will make all the vegetation we need in the winter and be there in the spring and keep a kind of mulch on the ground.

Mr. Tilson: Does the root-rot in your locality affect all the trees alike?

Digitized by Google

Mr. Burton: If it attacks any of them more than others, it seems to attack the Grimes heavier than anything else.

Mr. Tilson: In our locality that is the only apple affected. In our orchards we have lost all of our Grimes before they became three years old. It did not affect the White Pippin at all. It grows up thirty or forty feet high. I have now four Grimes' Golden which I believe now are going to make it. I set those out with a half bushel of oats and a bushel of ashes in the hole that I dug, and they are not affected so far. They are now three years old. I told the President two years ago that it might be a good plan to graft Grimes' Golden on White Pippin, for they seem to stand anything with us.

Mr. Burton: It is quite likely that Mr. Tilson is troubled with what I term Grimes' bark disease. It is very much subject to bark disease which affects it at the ground or a little above it. I don't known of any other tree so affected, and I find some localities where we can't have the Grimes.

OUR NEEDS FOR THE FUTURE.

BY GEN. JOHN COBURN, INDIANAPOLIS.

I think public effort ought to be made in the way of legislation. This Society and its interests and interests of horticulture in this State has had very little from the State—not so much as I think they ought to have, when we consider that the agricultural and horticultural interests of Indiana are of prime importance. Greater profit and greater advantages are to be gained by the furtherance of these two great industries than by all else combined. While we have great coal and oil fields and gas fields and forests, yet we are peculiarly an agricultural State. I do not know but what we might claim to be the very head of the list as an agricultural and horticultural State, considering the situation of the State and the condition of our soil. We might especially claim to be the greatest agricultural State in the Union in proportion to our size. Of course Illinois is ahead of us by reason of a greater extent of territory, and so is Iowa, but taking Indiana all in all for what it is I think we stand very nearly at the head of the list. I want to talk to you a little while on the subject of horticulture. I haven't very much time, but I wish to speak a few words in regard to some proposed legislation in the interests of agriculture and horticulture. Our State Fair is a great thing, but it is largely a live stock fair. There is no objection to the State

Digitized by Google

Fair, but if Indiana progresses as it ought to as an agricultural State it seems that we will have to depend somewhat on the aid of the State. There should be in every county some kind of an agricultural station. The people could afford to have such thing, they could afford to buy the land and enclose it and set it out with plants and trees and shrubbery and whatever is necessary to constitute a horticultural establishment. They will never do that voluntarily—I mean under the form of a mere voluntary association. Such a project might as well be given up in despair in advance; it can not be done. Only a few men would take an interest in it. But there is another way it can be done and should be done, and that is through legislation. It may not be done in every county. It may be done in a few counties where there is more public spirit than in others. The project I am in favor of is this: To have an act of the Legislature authorizing County Commissioners to levy a small tax for the benefit of this project. For instance, here is Marion County. We want to have a horticultural station. It would have to be located somewhere out in the country. Connected with that I have also provided, or thought it should be provided, in the bill a means for the erection of public buildings for public assemblages. Here in Indianapolis we have plenty of buildings in which to hold public assemblages of an ordinary size, but for assemblages of an extraordinary size the people of Marion County and of the State can not be protected under roof from water or wind or rain or cold. It is not the business of the State, it strikes me, to levy taxes for the erection of buildings or to make the State officers responsible for the care of anything of that kind. So whatever I say contemplates county action. My plan is to authorize Boards of Commissioners to levy a tax for horticultural gardens, for experimental stations, and whatever buildings and greenhouses or what not that may be connected with them. The bill then I would suggest to the Legislature would be of larger effect than that even, and should provide also that they could go on after awhile and erect buildings out of this fund for public meetings. The people of the country are entitled to the best there is and never get it. When the people in the country come into town and there is a great meeting or any improtant question they have to stand out in the sunshine or dust or wind or cold or rain, and they are never comfortable, particularly the women. If the Legislature would authorize the levy of the tax I have mentioned then every county would build a great public assembly hall, and that would be a great addition to the needs of the people. But I must not ramble. Now we could not expect to raise enough in the first year or two years or four years to do anything of very great importance, but we could make a beginning, and this tax kept up from year to year for ten or fifteen or twenty years would accumulate a great

Digitized by Google

sum so that almost anything even beyond our highest expectations could be obtained. The right way it strikes me is to begin with the horticultural garden and in some place where land does not cost too much. However, it ought not to be too far from public inspection. It ought to be near enough to the county seat so that the people of the county could see it and so everybody would become interested in it. Locations could probably be found near to the county seats. We need public gardens and nurseries very much. We need places where experiments can be carried on properly. Our friend Burton is doing a great work, but the kind of work he is doing ought to be in almost every county in the State. How can this need be supplied except by a general contribution from the public? It can not be done by taking up subscriptions, because people are worn out with contributions. There must be some percentage of profit or something of that kind or men will not, as a general thing, go into anything of the kind. I would despair at once if the business was to go on upon the basis of contributions. A public hall at the county seat will be, to a certain extent, a source of revenue also. It would not be an expense and a loss entirely. Take one of our number of county seats such as Richmond or Greencastle or Terre Haute, or Franklin or Connersville, or Peru, or Logansport, and a public hall there would pay for itself. Lectures and shows and a thousand kind of meetings would assemble there, and that, it seems to me, should carry weight enough for the Legislature to authorize the passage of a law of this kind. Of course there is nothing compulsory in this. It is to be entirely discretionary with the County Commissioners as to how far they should go and what they shall provide for. But I would make a law broad enough so as to include not only horticultural gardens, but everything which might inure to the benefit of the people as the public assembly hall. Why, here in Indianapolis every year we have a great number of meetings where there are no accommodations at all for a great mass of people. When the Methodists met here last year they had to put up tents in the court house yard, and yet the people could not get in, and when candidates for president and vice-president come here during political campaigns there is no place for them to go except to stand out in the wind or sunshine. There is some accommodation at the State Fair, but the people are scattered There is no one hall there which will hold the people. In most of the flourishing county seats there is not the accommodations there ought to be, but people can go and receive instruction by lectures, speeches and sermons. The need of places to hold these assemblages is bound to become more and more trying as the years go on. The use of electric lines will make it possible for people to come a distance to the county seat. I do not think we properly appreciate this thing. Right square before

Digitized by Google

the people of Indiana is this great matter of public assemblages of almost every county in the State and the people will soon come to demand some kind of accommodations vastly better than we have. The only way, it strikes me, to get at it is by giving this authority to County Commissioners to raise the money and to make proper expenditures under such authority as the Legislature may delegate to them. People should have comfortable quarters in which to hold public meetings. Why should the people at important meetings be exposed to rain or wind or cold? The funds raised in one year will not suffice, but in the discretion of County Commissioners and under their direction this money can accumulate until a sufficient fund is obtained. The question comes, why should not the man who toils outdoors and the woman who works at home, when they come to attend great assemblages at the county seat have a comfortable place to sit down and hear what is said, consult with their friends and sympathize with those who are destined to become more and more an important affair in public matters. I do not think we could pass a bill through the Legislature authorizing appropriations for the mere matter of horticultural gardens, but we would have to couple it with agriculture and the mechanic arts and everything in which the industry of man is engaged, and with all these coupled together it strikes me that the measure would meet public approval. The Legislature will not fix the rate of taxation. They will have nothing in the world to do but just give authority to the County Commissioners and fix whatever levy they may see fit to do. We are living now in an age of experiment as well in horticulture as in electricity and machinery. There is a vast field for improvement for us. All over the world improvements are being made on this subject, and we ought to have the very best right here at home. I lived for two years in a dry country where nothing was raised without irrigation. It is astonishing what can be done by irrigation right here. In a dry season more is lost in crops in any agricultural and horticultural county in Indiana than would make a good irrigating station where experiments could be made on that subject. Take some reasonably sized stream like White River and dig ditches along the side of it until you can get fall enough for the purpose of irrigation and it would be found useful. The ditch would not have to run a very great distance until you could get enough to irrigate eighty or one hundred or two or three hundred acres of land. This would be of importance to the agricultural and horticultural interests of this country. The best crops I ever saw were crops of beets, and onions and barley and wheat and oats produced in irrigated countries. Of course we would not need irrigation every year, but if preparations were made for it we could be ready. Probably not one-fourth of the time would there be need of irrigation.

Digitized by Google

I read an address by some gentleman, whose name I forget, delivered in Chicago on the subject of arid States or partially arid States, and he included some of the States of the Mississippi Valley, and made calculations on reasonable basis for some kind of irrigation. We will have to come to that some time. There ought to be a committee appointed to see that the importance of the legislation I have outlined be brought before the Legislature, and each member of this association should see his member of the Legislature and call his attention to it. You can not come here after the assembly meets and make very much impression on the members, for whatever impression is made in connection with legislation generally has to be begun at home. When the General Assembly comes here hundreds of different projects are brought forth and they are pushed all the time with great assiduity by the members, and their time is largely occupied by these things that are forced on them. When you scatter and go home you should talk to your member of the Legislature about these matters I have outlined. They are not political questions. Every one should be interested in them. I do not believe there will be before the Legislature any more important subject than this very one of giving authority to the County Commissioners to act on this question. I think you gentlemen could not do better than to constitute yourselves committees to see the members of the Legislature and talk upon this subject. They may turn around and say to you, "We do not want to burden the people with taxes. We do not want to add to the expenses of the government." It is not going to cost very much and in ten years a considerable fund can be accumulated. I earnestly ask and urge you to consider this subject. Four years ago the Society endorsed a project something like this and it was put in the hands of a special committee, and one of the newspapers happened to make some remarks in condemnation of it and I never could get a meeting. This was simply because some politicians thought it would damage anybody that would advocate it. When we remember the vast amount of legislation that is shoved before the Legislature and the many demands that are made on them in the eight weeks they are here, it is not surprising that many subjects go unconsidered. Talk to your members at home and we will talk to the members here and if they are opposed to the project we will find it out, and if they hold themselves open to conviction we will find it out, and if they are in favor of it we will try to enlist some of them as members of the committee for that purpose. I don't know of any other way practically to get at this subject than this, and I hope that before this meeting adjourns some resolution will be endorsed with reasonable terms which will meet with your approval.

Digitized by Google

DISCUSSION.

Mr. C. A. Howland: I am in favor of much legislation in the interest of horticulture. The truth is the horticulturists have never received of the Legislature of the State that amount of consideration that was due them. I am not only in favor of legislation in order to form an experimental station in the different counties, but I am in favor of the Legislature giving us authority, or our commissioners authority, or the authorities of State authority, to go through the different school districts of the State, county and township and lecture the rising generation on the best methods of raising fruit and the importance of protecting the birds that protect the fruit, and also the importance of causing the waste places in our State to produce—not the original forests—but to produce trees sufficiently dense and desirable for the home of the birds that destroy the insects that destroy the fruits. I think the most thorough way we can get at the mischief-makers and destroy them is by educating the rising generation up to the view that it is wrong to destroy the birds, and it would be a proper thing to educate them to do different from what they are doing now. As you and I now know it is a very common thing to see some half-grown boys running through the country with their guns destroying the birds that protect the fruit. I am further in favor that it shall be punishable by fine and imprisonment to destroy the birds of the forest, and also that those who destroy your fruit in your orchard, as they are in the habit of doing, that there should be some punishment for that. I am still further in favor of legislation in giving police powers to supervisors, or if not to them, to a special policeman in every mile square that is adjacent to some large city. I have two large orchards and one of them is within a mile of the corporation. It is no difference how much time and money I spend on that orchard, I only get to see the bloom and the green fruit. This experimental orchard is in the line of Brother Coburn's remarks, and my own sentiments in particular. I think we have got to raise new varieties from the seedling. That is what we will have to do. I hope there is a better way because that is very uncertain, but the good varieties we have have come that way as a rule. It is a very little matter for a man to plant a thousand apple seed and let them go to bearing, and in doing that he might do a vast amount of good to

Digitized by Google

the whole world if he produces an apple superior to the kind of apple we have now. I don't know how a man could do more good in a material way than to plant apple seeds, looking forward to their bringing forth something that would be a blessing to the world. I think there should be a premium offered to any one that would produce a better apple than we have at the present time. I think he should be well paid, because if he succeeds in doing that he has done a great work. If an appropriation is made for an experimental farm in the different counties, of course that is a great work if it is carried on right. These apples that are exhibited here are beautiful, and the important question is how can we raise such apples? Of course we have troubles which we did not have fifty years ago. An important thing, of course, is the selection of a locality. I have one orchard on clay ground and another on second bottom, sandy loam. The orchard on the sandy loam has been pretty well taken care of. It has been cultivated and fertilized, while the orchard on the clay ground has been neglected. Still the orchard on the clay ground produces 100 bushels of apples where the other does ten to the same amount of trees. Now what is the difference? There must be some difference in the ground or the locality. We want to investigate all these things. We want to know what the reason is. My own notion is that it is the location of the orchard and the soil perhaps. It might be shown that there is some other reason and perhaps a good reason for this difference in the two orchards. Of course experiments along this line will enable us to come to the conclusion as to whether it is the soil or the locality that produces the apples. That is one of the needs of the future that we find out these things for ourselves. I want to speak once more about legislation, and I hope the members of this Society will take an interest in this thing. There is no trouble about the agricultural and horticultural elements of the State of Indiana getting what they want if they will all go to work for it. If we don't get it it is because of our neglect. You will notice the game and fish law. The sportsmen got up the bill and it suits them, and the are enthusiastic over it. It gives them all the pleasures and profits, and the owners of the land all the burdens and misfortunes and trouble. They have it all on their own side, and none of it on the farmer's side. Let us look out for our own side a little. I am in favor of a closed season of five years, and that no

Digitized by Google

bird shall be killed anywhere in the State of Indiana unless it is a hawk or an English sparrow or some bird of that kind.

A Member: Make it ten years.

Mr. Howland: Yes, or twenty years. I don't want to take any advantage of the law myself. I want it so that even the farmer that owns the land can not kill these birds. I am in favor of more birds and more fruit, and thus the world will be better.

Mr. Kingsbury: I want to say a word or two in support of the proposition made by General Coburn. I am in favor of some stringent penalty for violating the game law and shooting insectivorous birds. I don't know that I would go as far as he does and advocate imprisonment for so small an offense apparently as shooting a bird. That is pretty serious. But if there is anything short of that that would stop the shooting of the insectivorous birds I would be in favor of enforcing it. So far I agree with him, and I agree with regard to making the quail law continuous for five years, with the privilege that if the commissioners find that quails are becoming so abundant that they are a nuisance that they may allow farmers to dispose of them either by shooting them themselves or by allowing hunters to come on the ground. Many farmers would not be willing to have the hunters come on their lands because they would lose not only the quail but sometimes their stock by these trespassers. General Coburn does not desire any appropriation from the Legislature. His idea is merely to give the County Commissioners the privilege if they think proper to levy a very small tax for the purpose he states—for an experimental garden and a building for the use of the farmers and the institutes and so on in the county seats. The cattle-growing interests, the swine-breeding interests and so on can get recognition from the Legislature. They recognize these interests as interests that bring money in to the treasury of the State, but they do not recognize the horticultural business as such. But if it were assisted and developed by the State we know it would become one of the moneyed interests of the State. We know that is so in Michigan and California especially, and in Colorado and other States it is a growing industry, which brings much money into those States. Therefore I am in favor of asking the Legislature for this privilege

Digitized by Google

to be given to the County Commissioners to make a small levy for this thing. There are some counties in this State in which the horticultural industry could not succeed by the very nature of things, and there are other counties where if assistance is given it would become a valuable industry. Therefore it is our duty as members of this Society to encourage this industry in this way. We do not ask the State for aid. We do ask it to authorize County Commissioners, when they think it proper, to make a small levy to promote and further this industry.

Mr. Howland: In regard to the appropriation which I spoke of, I referred merely to an appropriation for this Society that it might carry out its experimental orchards. That is what I was driving at at that time, and which I think they ought to do.

Mr. Thomas of Grant County: Last May I was in a county of our State where they were just building a new courthouse. In one corner of the first floor they had a room almost as large as this for the use of farmers. Farmers could go there and spend part of the day whenever they came to town, or they could hold a meeting. With regard to the County Commissioners making appropriations for building a hall, some years ago the Legislature provided that County Commissioners might make a levy to build soldiers' monuments. Afterwards the law was amended so that if it was desired a memorial hall could be built with this money raised in this way. In Wabash County they went to work along that line, and a year ago last November they dedicated a very nice building, a memorial hall in the city of Wabash. In that building was one room set apart for the farmers of the county of Wabash, and they have it furnished, and they have their tables and keep reading matter there, and farmers coming into town have a perfect right to have access to that room any day during the week. They can come in there and pass an hour or two in reading. Since they built the hall and dedicated it, it has been found inadequate to their wants, and a piece of ground right beside the lot on which the building stands has been bought, and they are going to build an addition to the memorial hall.

Mr. Millhouse: Mr. Howland spoke of the apples of fifty years ago. Fifty years ago we had all the birds the woods would hold

Digitized by Google

pretty nearly. We did not then have hundreds of people coming out in Marion County from Indianapolis every day, Sunday included, seeing how many birds they could kill. There is only one way to protect the birds and that is to send the men that come out to shoot them, especially on Sunday, to the stoneyard or the workhouse. I want a law so that no man shall be allowed to go on the farmer's land and shoot the birds. And that no farmer should be allowed to shoot the birds excepting between the first of January and the first of February when he has nothing else but English sparrows to shoot.

Mr. Burton: I believe this is a free talk. I have looked upon one thing as being especially the need of the hour, and that is the building up of horticulture in Indiana. That it is on the decline I am sure. I have found that the apple business in this State has almost passed away. In farmers' institutes I have asked how many people had orchards, and sometimes one and sometimes two hands would go up. Something is the matter and this thing needs to be looked after. Undoubtedly Indiana is as capable of growing fine fruit as any place in the world. Indiana sent the finest Winesaps to the Paris Exposition. Three places sent fruit to the Paris Exposition that took premiums. I sent two barrels of fruit myself, one last year and one this year, and each took a premium. I took the premium for the best display of apples against the horticultural societies in all parts of the world. This indicates that Indiana can grow good apples. Indiana does not consume one-fiftieth of the apples she needs. Ninety-nine out of one hundred children of farmers are without apples. The men will buy a nickel's worth of apples in the town and eat them, and the women and children on the farm do without. We used to have apples. As far as spraying is concerned too many farmers began using poor pumps. What we need is to educate the people along this line. Somebody should be sent in the different communities to talk about fruit. I asked Professor Latta, Superintendent of the Farmers' Institutes, why this was not done, and he replied that this was the very thing he wanted to do but could not; that he could only send two speakers to any institute; that if he had a larger amount of money he could send experts to give instruction. We want him to have enough money to send experts to particular localities for that particular

Digitized by Google

purpose. People should not try to grow corn on apple land and raise fifteen or twenty bushels of corn when that particular land devoted to apples and properly cared for would make them rich. If the Legislature would make a sufficient appropriation to farmers' institutes this matter of fruit could be taken up and specialists sent to teach the people.

Mr. Clore: Mr. Burton spoke of people making a mistake in buying sprayers. What sprayers do you use?

Mr. Burton: The Morrill & Morley sprayer.

The President: I think Mr. Burton has struck the keynote to this whole matter. Of course the other subjects brought up are important and should have due consideration. But I think the question as presented by Mr. Burton is the vital question at this time and that is the question of interesting our people in fruit-growing to the extent that they will make a success of it. As he says, we have been failing through these years through neglect. We have not taken up proper lines and followed out the work to success, and hence there have been failures along the line with very few exceptions. Mr. Burton is an exception, and a few others, and the question is now that the people have become so discouraged and disheartened in the matter of fruit growing in this State, how shall we again interest them and get them started in the right direction? I have no question at all in my own mind about the fact that we can make it a success if we undertake it properly and proceed on proper lines. They have succeeded in Ohio and in Illinois in the same latitude and in the same soil and under the same conditions, and why not here? A few years ago in western New York they were failing utterly in growing apples, and Professor Bailey and some influential men in the State went to the State Legislature and asked for a large appropriation, and eventually got about $16,000 for two congressional districts in New York. By the expenditure of this money remarkable results were brought about and the fruit growing in western New York has simply been revolutionized and set on its feet through the agency of that appropriation, and many men have gone into the business who have succeeded beyond their expectation. We can bring those results about in this State if we apply the same remedy.

Digitized by Google

Mr. Henry: Of course I do not know how it is in other parts of the State, but you take it in the northern part of the State and in the northwestern part of the State, and I know the farmers and the people in the country generally are very much discouraged. Our farmers have had an entire failure of the wheat crop for the last two years. Prospects now are rather fair, but none the best, and a great many are asking the question, "What shall we do? What shall the farmers do?" They can not raise wheat; they can not raise clover. The clover crop has been a failure, and the question of fruit growing has been a failure also. That is it has been a failure in the way it has been conducted. There is not a country district in the State I do not believe but what has lost population within the last ten years. You will notice that the country schools are beginning to consolidate, as there are not enough children in the districts to make a school. Why is this? It is simply because the young, and thrifty rising generation are going at something else. They are leaving the country districts and the old farmers lack interest in fruit growing or in farming generally, and something, I think, ought to be done to arouse an interest in the State of Indiana in agricultural and horticultural pursuits. Teach the people what to do and how to do it. There is no question but our section is one of the very best apple-growing and pear-growing sections there is. I believe the United States Government at one time made a report that our section of the country was the best pear country in the Central West, and yet there is not a pear orchard in northern Indiana that amounts to very much, and I think a large appropriation for the purposes of educating the people along this line would be well. There should be a law requiring these old orchards to be cut down and done away with, and then teach the people to begin anew and teach them how to raise their trees correctly and how to spray them. About two years ago a man came along my place and said, "I am spraying fruit trees at ten cents apiece." I said, "Are you getting much to do?" "O, yes, some." He had a tin sprayer which could be bought out of a store for a dollar and a quarter. The next year I talked to several farmers about spraying, and they would say to me, "You needn't talk to me about spraying. There was a man around here last year who sprayed my trees, and they are just as bad as ever." That is about all the knowledge they have about spraying. There seems

Digitized by Google

to be a lack of knowledge on the subject of spraying and on general principles of fruit growing.

PLACE OF THE APPLE ORCHARD IN THE ECONOMY OF THE FARM.

BY H. H. SWAIM, SOUTH BEND.

From the earliest settlement of this country the apple has been recognized as an important factor upon the farm. Not alone for its commercial value, for those consumed upon the farm have a value which can scarcely be computed in dollars and cents.

The pioneers recognized the necessity of fruit to balance their rations of hog and corn and planted a few apple trees almost as soon as the land was cleared. Planted as they were in the virgin soil, protected by the surrounding forests, they produced bountiful crops of fruit with but little further attention; this success induced the settlers to continue planting until finally most farms had a flourishing apple orchard, furnishing a bountiful supply of health-giving fruit for the family, and in many cases adding a source of revenue to the farm.

Conditions have changed so that it requires more care and skill for us to grow apples than it did in this early day. We have not the virgin soil in which to plant our trees, the forest protection has been removed, and we have many more insect pests and diseases to contend with, but the value of the apple as a farm product remains unchanged, and the greater difficulty we have in producing them should only make us prize them more highly.

The farmer of to-day has a much greater variety and better prepared food than had the pioneers, but we have not enough that we can spare the fruit which we now have in such perfection and plenty. There has been much improvement in the variety and quality of our fruits in recent years; while the apple may not have kept pace with some other fruits in this improvement of varieties, it still holds its place at the head of the list of fruits and stands pre-eminently the fruit for the farmer. It is easily grown. Any farmer who has enterprise enough to raise blackberries along the fence rows can grow apples to some degree of perfection. The season during which they can be had in their natural state is longer, and the variety of ways in which they are used is greater than any other fruit.

With ordinary care in the selection of varieties, handling and storage, a farmer can have a bountiful supply of this delicious fruit from July to April, and if he is fortunate enough to be in reach of cold storage facilities, their season need never end.

Digitized by Google

There is usually a surplus of summer and fall apples which far too often are allowed to go to waste; probably the most satisfactory way to care for these is by drying, thus converting them into a marketable product if not needed for home use.

We all remember how this was done in our boyhood days. How vivid the memory of the apple paring bees, when the young folks gathered evenings in the old farm house, peeled and quartered apples and strung them on strings, to be hung next day in festoons about the kitchen stove to dry, and incidentally serve as a fly roost. This was not all that was done at these paring bees, but I need not digress to give the full program, for I doubt not I have already stirred to life tender memories in the hearts of many of you. The drying was sometimes accomplished by spreading upon racks and placing in the sun, but this was not always satisfactory, for farming was not all sunshine then any more than now. There are now a number of different makes of evaporators on the market in sizes to suit the needs of all; while they take away much of the romance connected with the old style dried apples, they make a much cleaner looking product.

The most careful grower can not have all his fruit perfect, and when we come to care for the winter apples we find more or less windfalls and culls, which must be used at once to avoid waste. The evaporator is here again brought into use, but the bulk of these are made into cider—the beverage of the farm. This has a market value far below hand picked winter apples, but it is a means of saving that which would otherwise be a total loss. That which is not sold or consumed as cider can be converted into vinegar. While this has to compete in the market with city made vinegar, it always finds a ready sale. Another common way of using cider is the making of apple butter. This adds very materially to the food supply for the farmer's table and is another product of the apple which finds a ready market. These are usually considered small matters by the average farmer, but in the aggregate they add very materially to the income of the farm. Considered from a financial standpoint no farmer can afford to be without a healthy, well cared for orchard. There are other values but little less important. Chief among these are their health giving qualities. What we will call the social side of the apple is also worth mention. I have already referred to the social gatherings of the neighborhood boys and girls for the purpose of paring apples to dry, etc. Not less vivid is the memory of the homes of our childhood. The long winter evenings with father and mother, brothers and sisters, gathered about the roaring fire in an open fireplace, a picture that would never be complete without a pan of rosy cheeked apples and the pitcher of cider.

Digitized by Google

These memories never fail to arouse tender feelings in our breasts which make us better men and women.

DISCUSSION.

Mr. Burton: That reference to drying apples brings to my mind the fact that I used to string apples, and when they were dry there would be a hard place where the string went through.

Mr. Swaim: That was because you did not take the core out.

Mr. Burton: A dried apple is not like one which we term evaporated. If you string your apples on a wire and don't let them touch, there are no hard places in them.

Mr. Swaim: I would like to ask Mr. Burton how he would keep the apples apart.

Mr. Burton: I would stretch the wire horizontally. I want to speak about the Kentucky red cider crab, which is rarely grown except in southern Indiana and Kentucky. It is largely grown in Kentucky to make cider. It makes rich crab cider; these apples when stewed are as rich as apple butter, and when they are sweetened with a proper amount of sugar they make one of the most delicious messes of apples that could be prepared. Those apples will keep until the middle of next summer. You could not eat one of those apples in the raw state. It is not only sour, but it is bitter and puckery, but after the cider leaves the apple, and when it is cooked, that isn't there. They are a little more subject to scab than most of our apples. That is the only weak point about them.

Mrs. Stevens: I do not think the Society ought to go on record as allowing Mr. Burton to say that they drink cider in Kentucky. I live too close to the line for that.

The President announced the following committees:

Committee on Finance—G. P. Campbell, Snead Thomas and Amos Garretson.

Committee on Exhibits—L. B. Custer, W. C. Reed and Sylvester Johnson.

Committee on Resolutions—Mrs. W. W. Stevens, H. D. Simpson and J. C. Grossman.

Digitized by Google

Thereupon the Society adjourned at 5 o'clock, until 7:30 o'clock p. m., at which time the Society reconvened, and first listened to an address by President W. E. Stone, President of Purdue University:

EDUCATION FOR THE HORTICULTURIST.

BY W. E. STONE, PRESIDENT PURDUE UNIVERSITY.

I will say in the beginning that the invitation to speak before your Society was accepted with considerable reluctance. It seemed to me presumptuous to take up your valuable time with anything which I might have to offer, for I regard you as experts in a field in which I have no expert knowledge. I stand here, therefore, by your indulgence, acknowledging on my part a pronounced taste for the fruits of your efforts, although I am unable to contribute to your practical knowledge.

I suppose there is no kind of industry or profession at the present day, certainly none which plays any considerable part in the affairs of men, of which it can not be said, that its methods have in recent years undergone great changes. The condition is that which we refer to when using the phrase "a business has been revolutionized." I think I do not err in saying that this general statement applies with great force to the art of horticulture. Let us look for a moment at some of the progressive changes which have affected your business during the present generation. The wonderful development of facilities for transportation has extended your market and at the same time increased the number of your competitors. It has also contributed toward familiarizing your customers with all of the varieties of fruits and vegetables, and aided them in cultivating a more discriminating taste. The same conditions facilitate exhibitions and conventions, sharpening the wits and assisting in the exchange of new ideas. There has sprung up a new literature of horticulture. Books on horticulture exist of very early date, but their character is different from the books and journals of to-day. Formerly they were discussive and descriptive; now they are practical, scientific and business-like. Again, what activity in originating and propagating new varieties. Many of these may prove worthless, but, until this fact is ascertained, no one can afford to ignore them. Even the methods of planting, cultivating and harvesting of many kinds of fruits and vegetables have been greatly modified. The construction of greenhouses has been radically improved and the use of these structures extended to cover almost all forms of small fruits and vegetables for which there exists an unseasonable demand. The methods and management of orchards and gardens have be-

Digitized by Google

come intensive, concentrated, and at the same time have developed into affairs of large magnitude. One hears now of the drainage and fertilization of the soil. Artificial and animal manures intrude themselves upon the gardner's attention. Insect pests and various diseases of plants, formerly unheard of, spring up, and in due season we are told how to destroy or combat them by our learned friends of the experiment stations. These experiment stations command intelligent attention to their publications and scientific researches. And so I might go on at great length if it were necessary to show that the successful horticulturist of to-day is expected to know a great many more things than his predecessors of a generation since, and must be able to cope with conditions quite different. Now, if we analyze the situation, we find that these changes represent in every case the application of scientific principles to business. Your business, like any other, is advancing because it is being conducted more and more on a scientific basis. You say that competition is closer. No—men who have the best scientific equipment can do things and are doing things which can not be done by those who lack it. The successful horticulturists are those who are utilizing to the greatest extent the scientific progress of the generation. They may not know it under that name; they may repudiate any interest or sympathy with science, but the fact remains they are making good use of what science has done for their business.

Every one knows that to successfully engage in any enterprise these days, one must have the best equipment possible. It is not generally recognized, particularly in the various agricultural occupations, how important a part of this equipment is scientific training, but it does not require any abstruse reasoning to come to the conclusion that in a business based upon, and constantly developing upon scientific lines, a knowledge of the science involved is highly important. Some of the industries are already keenly alert to this situation and welcome to their ranks those who have pursued a careful course of scientific training therefor. On the other hand it is also true that many who rate as successful men place little value on technical or scientific training for practical affairs. Such men are usually those who have risen by their own efforts, in other words, self-made men. They, with commendable pride in their own success, are disposed to expect similar achievements from others. To such I would say, first, that no one looking forward to a life career can afford to neglect or omit any step of preparation which can contribute to his prospective success. If he has good natural wit, so much the more reason why he should supplement it by training and education. If he has no more than ordinary intelligence or shrewdness, he certainly should not neglect the assistance of special training. Again, the day of the self-

Digitized by Google

made man is passing. In the early stages of every industry or profession, before its principles have been crystallized or before large funds of knowledge have accumulated, it is possible, and usually necessary, for those who would master it to do so by their own efforts, accumulating by unaided study and experience a masterful knowledge of the industry. But just in proportion as the industry advances this process becomes more and more difficult and unprofitable. The old apprenticeship system, while it has many good features and was at one time adapted to the conditions, is now an anachronism. No one who hopes to master any profession, or trade, or business, or industry, expects these days to do so by his own efforts. Special schools, technical or professional in character, have sprung up in connection with the modern scientific development of business, whose function it is to impart to young men and women the fundamental principles of their industry in a much briefer time and with much greater efficiency than they could hope to do for themselves. As well might the Indiana fruit grower attempt to market his strawberries in Chicago with a hand-cart, in competition with his neighbor who calls into service an express train, as for a young man to hope to prepare for a career in the coming generation by self-effort, instead of utilizing the latest and best opportunities for training.

Of course, no one expects that technical training alone will fit a man for business, or that it can be a substitute for common sense, or experience. A man must have all of these. Teaching a child to count will not make of him a business man, but nevertheless you will not omit to teach your boys and girls to count, because you know it will be a valuable adjunct to their other mental qualities, and so you would not knowingly deprive your children of any kind of education or training which was likely to apply to their future career. You see I am making a plea for technical education. By technical education I mean a knowledge of the natural sciences and their application to any industry or profession. Agricultural education is technical education of the most pronounced kind. Because agriculture in its various forms, one of which is horticulture, is so wholly and completely the utilization of natural forces, it is the industry above all others in which some knowledge of these forces is essential to success. Heretofore, farmers, horticulturists, etc., have been self-made men, partly because there have not been opportunities for training and partly because the state of the art has made it possible. But let me remind you that agriculture is beginning to be as progressive as any of the other industries. The applications of science are beginning to tell, and the day is at hand when in this neglected field technical training and proficiency are to be quite as essential as in any other.

Digitized by Google

I do not think this is recognized so generally as it should be. Some men foresaw this a generation ago. The United States government foresaw it and established the magnificent agricultural colleges that are such a credit to our country's educational forces. But the members of the industry have been slow to appreciate or utilize the opportunities thus offered. Just now there seems to be a general awakening and our neighboring States are patronizing and sustaining their agricultural schools with generosity. I fear lest Indiana may fall behind in this movement. The facts show that your agricultural college, with somewhat meagre equipment, has been producing good results and has been well attended as compared with other States. It needs and must have a better equipment for its work, and, I say frankly, it must take that equipment and do better work, and the farmers, the stock growers, the dairymen, the horticulturists of the State must give it better support and send more of their sons and daughters to it. We must all do more and better if we are to live up to the demands and magnitude of the industry which your society represents.

I wish to appeal to you to cultivate a better knowledge of the institution which has been established in Indiana for your benefit, and as you know it better and better, I hope you will make greater use of its facilities and contribute of your influence to secure for it the co-operation and aid of all who are interested in the progress of agriculture.

President Hobbs: We are fortunate to-night to have with us Professor Burrill of Illinois. He discovered some years ago what the apple blight was, or what was the cause of it. Now if he can tell us to-night or sometime in the near future what the remedy is we will see that his name is written high in the new hall of fame we are going to have shortly.

THE BOTANY OF THE APPLE.

BY PROFESSOR T. J BURRILL, UNIVERSITY OF ILLINOIS.

What is an apple? If there is one thing upon which there is no disputing concerning taste, it is that an apple is a good thing to eat, a very excellent thing to eat. This is definition enough for some people, and in certain moods and fancies of us all, it is altogether sufficient. But trying again, the reply may be, an apple is a spheroidal, fleshy fruit, covered with a thin skin and containing a five-divided core with thin but hardened walls, within which several seeds are produced. This is quite an answer, different from the first and better or worse according to the standpoint

Digitized by Google

taken. Again, an apple is a pome, and a pome is a fleshy, indehiscent epigenous pericarp, containing several cartilaginous loculi. What an advance! Here we have things, if not done up in a nutshell, at least enclosed within an impenetrable coat of mail. What a marvelous thing an apple is, if it can be so described! Is there anything more to be added? Have we fully answered our question? By searching, possibly something further can be found. Now a few learned as well as honest people read into the history of a world-important transaction, that an apple was the tempting morsel through which paradise was lost, and as a perpetual reminder of our forefather's transgression each of us of the sterner sex carry in our throats to this day the inherited swelling called *pomum Adami!* An apple, therefore, is a significant thing, as well as a something good to eat, or about which to conjure with words. Alas! that higher criticism should destroy William Tell and his wonderful archery, and that ruthless text-readers should deprive the first gardeners of this best of all the fruits of the earth.

But there are methods of dealing with a text besides asking a direct question and replying by a closely formulated answer, otherwise it is feared many sermons would be shorter even than modern pew-holders demand. My subject is the Botany of the Apple, and botany is text enough presumably for any such occasion, though limited as in the present instance to one species of the vegetable kingdom.

If we ask again, "What is an apple?" the reply may be made, that it is either the swollen end of a branch, or it is a joined and thickened cluster of leaves. This, however, in either alternative, may not be very evident, and so at least permits explanations, and this again seems to be the opportunity we have been seeking. Let us see.

One hundred and fifty years ago the immortal Linnaeus, the father of botany, penned the first line in existing literature bearing upon our subject. He was not the first to conceive the idea which his words expressed, and he was apparently very cautious in his statements. Here they are written when it was considered that nothing but the Latin tongue was good enough for scientific statements. "Principium florum et foliorum idem est." This being translated is: The origin of the flower and of the leaves is the same. And again: "Periantheum sit exconnatis foliorum rudimentis," or the perianth (calyx and corolla) may be from the rudiments of united leaves. The use of sit instead of est, in this latter sentence, shows his state of mind. The calyx and corolla of the flower *may* be, not are, rudiments of leaves. It was a moot proposition, but it is thus shown that the question was then in debate. Forty years later, in 1790, the illustrious Goethe published a work which has since been much cited, under the title, "Versuch die metamorphose der pflanzen zu

Digitized by Google

erklären"—an attempt to explain the transformations of plants. In this work Goethe used *is* instead of may be, and advocated the proposition that the parts of the flower are transformed leaves. There were others before him who as boldly asserted the same thing, but the prominence of the great German scholar and author in other matters gave his writing wider reading and more respectful consideration. Still, owing to the apathetic or prejudiced spirit of the age, even Goethe's work was considered a piece of fanciful and fruitless speculation, rather than the presentation of a fecund truth, through which the eyes of the blind might be opened to the beauties of scientific revelations and to their untold importance in practical life. It must be confessed, however, that Goethe mixed with his science many products of his sportive imagination having no support through evidence. This was the habit of the age. There was then little real science, little appreciation of that inductive logic the following of which has since so transformed the modern world in all departments of life and of thought. But gradually in the early part of the new century, that now waning to its close, the methods of modern science were more closely followed and permanent steps in the marvelous progress, which distinctively characterizes and crowns our era, were soon made. When De Candolle of Geneva published in 1820 the second edition of his Theory of Botany (Theorie Elementare de Botanique), apparently without knowledge of Goethe's work, he discussed the homologies of the parts of plants, basing his ideas solely upon observed facts. And when in 1827 he wrote his Organographie Vegetale, he was positive in the conclusion that flowering plants are composed of only three elementary or basic organs, viz., root, stem, and leaf, and that from these are formed all other constituents of vegetable structures, including the parts of flowers and the make-up of fruits. In this at length the philosophic botanist was supported by the entire body of his contemporary scientists. It took half a century from Goethe to establish a doctrine, the facts of which now seem plain and easy of demonstration by anyone, and to which more than another half century has practically given universal acceptance on the part of all those most competent to speak upon the subject. It can not be said that root, stem, and leaf are any more entitled to rank as the primary or fundamental organs of plants in any other sense than that most other structures are directly or indirectly modifications of them, but in this sense they must be so regarded. No matter how much they may be disguised in other structures, we may wisely anticipate finding the marks of one or more of these organs in all vegetable growths.

To illustrate: A simple case is that which we call a strawberry. We all know the wild plants sometimes called barren strawberries (Potentilla). These have much resemblance to the plants which bear the crimson,

Digitized by Google

pulpy fruit. Indeed botanists can hardly separate them, or at least some of them, generically from the true strawberries. They differ in that there is no fleshy body on which the numerous so-called seeds are borne. The latter, however, are present and are borne, as in most plants, on the terminal end of the stem, called a receptacle. In these "barren strawberries" this last named organ is clearly the end of the stem itself, scarcely modified except in the use to which it is put. But by a little further observation we can be just as confidently assured that the somewhat swollen and meaty part of some wild strawberries is the same in origin as the dry receptacle of the other plant. Then it is only a matter of further swelling and perhaps of increased meatiness until we have the most luscious of these ambrosial productions. The tasteless, unattractive, small tip of the stem has become the meaty-melting-mouthful of perfumed sweetness and sourness which we call the strawberry, but which in its highest, most aristocratic development bears the indubitable marks of its low origin.

As a different, but still simple case, the tuber, which we call a potato, is a modified branch. Potatoes are commonly classed among root crops, but the tubers are the swollen terminal ends of modified branches of the stem. The so-called eyes are clusters of buds, structures not usually produced on roots. These special branches have formed the habit of turning down instead of up, as do most stem-branches, and of remaining buried in the soil. The white slender part of the branch whose swollen end is the tuber is easily distinguished from the real roots of the plant. In the case of the peanut similar branches, growing first above ground and bearing a flower, subsequently turn down and penetrate the earth. In both the departure from normal forms can be so easily traced back to the latter that we will not further describe the process. A common potato is merely an enlarged and richly stored portion of a true stem, a peanut is a bean produced in a pod.

Now let us see what a pod is. In some cases this is very readily made out. We feel sure at once it is not a transformed root, and it looks more like a modified leaf than a part of a stem. Taking this hint it requires no great acuteness of insight to discover that the pod of a garden pea is a folded leaf, or rather it is a structure which originally was a leaf and which still bears marks of that origin. The line along which the peas are borne marks the joined edges of the leaf, while that along the opposite side is the midnerve. In some instances a reversion takes place when the structure is more leaf than pod, showing very clearly the nature of the latter. If now we examine the ripened structures in the center of a flower of the common peony we shall find a cluster of from two to six smaller pods each shaped something like that of the pea. They stand on the end

Digitized by Google

of the stem with their inner edges meeting in a line of the axis of the latter, and their outer edges in radiant lines from the center. On opening these little pods we find vertical rows of seeds along the inner or central face of each of them. Here again the seed-bearing lines mark the joined edges of a folded leaf modified into a pod. We could easily represent the fruit cluster of the peony by similarly arranging so many pea pods in a cluster.

It would seem, perhaps, a long distance from an arranged group of pea pods to an orange, but a little comparison may serve to make the structural differences appear less pronounced. Cut the orange transversely through the middle and note the radiating lines reaching from the center to the thick rind. Note that the seeds are found only next the central column. Peel the fruit and carefully separate the pulp into the divisible parts. What have we here in each one of these sections, if not a representative of the pod as produced by the pea or the peony? It is no stretch of the imagination when we conclude that an orange is a cluster of leaf-formed parts with the walls in contact thin, but still separable, and with the outer walls thickened into the peeling or rind of the fruit. Each part or modified pod instead of being hollow is filled with the juicy pulp. There is no room for doubt, however, that an orange is a cluster of some eight to ten, several-seeded, pulp-filled pods, and the entire fruit is a cluster of modified leaves set apart for special service.

We are now perhaps ready by so guarded an approach to ask again, "What is an apple?" The peony fruit cluster is a good type for the apple core. In this there are five pods with seeds attached to the inner angles. Here then are five specialized leaves each infolded and seed-bearing along the meeting margins at the center of the fruit. By looking closely at the cross section of an apple we are able to find at the outer angle of each pod a rather obscure green dot representing the midvein of the constructive leaf. But there are other and plainer green dots and a fleshy mass of tissue which calls for further attention. All botanists agree in what has been said so far, concerning the structure of an apple; but difference of opinion are expressed as to the make-up of the part external to the core. The circlet of five green parts, constituting the eye of the apple, is the persistent calyx of the flower. In this, too, all are agreed. Each point is a sepal and each sepal is a modified leaf. Does this rudiment of a leaf stand upon a thickened stem hollowed out and enclosing in its cavity the circle of core-leaves, or are the sepals themselves joined together except at the tips and thickened to form the rich pulp? In other words, is the mass of the apple a consolidated bunch of leaves like the orange, or is it a thickened, urn-shaped end of the stem on which the floral-organs are borne?

Digitized by Google

In this there is much difference of opinion, tending in later years to the latter assumption. It is well known that the bundles of fibers forming the midvein and stalk of a leaf run down in the tissues of the stem for some distance below the point of leaf attachment, as a distinct strand. By making longitudinal sections of an apple it is easy to find green lines running from blossom to stem with a wide curve around the core. By a little inspection it may be determined that these lines correspond to the green dots seen in cross-section of the fruit, and by further examination it is found that the line corresponding to the more conspicuous dot, placed directly outside of each core-cavity, runs into a sepal at the eye. The five dots then immediately exterior to the five folded core-leaves are transverse sections of the midveins of the five sepals or component parts of the consolidated calyx, or they are traces in the thickened stem of the fibrous bundles descending from these midveins. In any case these lines and dots, according to the direction of the plane of section through the fruit, preserve to us remarkable suggestions concerning the life-history or the apple. These rudiments seem to persist solely for this purpose. They are retained out of respect to their ancestors. In the Siberian crabs the green tips of the eye are deciduous; the ancestral respect is less deeply ingrained in the modern progeny, though the dots and lines continually recount the story from generation to generation. Turning again to the cross-section of the fruit, we find five other dots alternating with those already described. These each stand in a radiant line midway between the exterior points of the core. In the longitudinal section the corresponding lines are not so well marked as are those running into the sepal tips, but are still easily followed and clearly emerge in the angle between the green leaflets of the eye. Upon an examination of the flower, this is found to be the position of a petal. The latter has departed this life, but has left behind the evidence and story of its being. As there are ten parts in the perianth or leafy composition of an apple blossom, so there are ten dots in the cross section of an apple, and the two sets of facts are correlated together in the phenomenal life-history of the fruit.

But in this cross-section there is a wavy line clearly enough seen encircling the core. In our orchard apples this line is usually faint, a mere trace, and it often weaves inward and outward like the folds of artistic drapery. A little study soon shows that the curves are not irregular, that they dip inward to approach the outer angles of the core, and swell in graceful stretches between these points, differing in their course in different varieties of apples, and in some essentially circular. In some cases, in very ripe fruit, a separation of the tissues along this line is observed, and in our common wild crab-apples this is a usual characteristic. At least after freezing, the very hard spheroidal core of the latter

Digitized by Google

fruit fits like a bone in its socket, from which it can be removed so as to leave a smooth surfaced cup, the walls of which are also bony in hardness.

By beginning at the blossom end of an apple and making thin slices by horizontal cuts, the meaning of the circular or wavy line in question can be made out. The first slices below the base of the eye have each a circular hole in the center through which pass the dried remains of the upper parts of the pistils (stiles). The pistils below merge into the parts of the core (ovary), while the tissues forming the lining of the central cavity (holes in our sections) grade unmistakably into those of the ring which engages our attention. All of the structure inside of the ring belongs to the core and has been derived from the five pistils of the flower; all outside of the inner cells constituting this ring belongs to the wall of the urn-shaped receptacle or consolidated sepals, whichever, in fact, this exterior and larger mass of the apple proves to be. Studies of cross-sections of very young apples show this boundary line to be at that stage a circular one; the various folds or curves seen in a matured apple are due to the development of the fruit and to its swelling through the process of growth. However irregular the line may be, it is to be noticed that it always runs inside of the ten green dots before mentioned. This must be the case if the line represents the boundary between the ovaries, the true fruit, and the surrounding mass, for the petals and sepals are always outside, in the flower, of the pistil or pistils. The greater swelling of the pulp between the radial parts of the core, usually pushes the five corersponding dots further from the center of the fruit than are the alternating five standing radiately out from the core-cavities, but the latter may be seen to be structurally farthest out because they are at a greater distance from the core-boundary line, and they are always found the outermost ones in sections of very young fruit, just as we should expect from the fact that the sepals are exterior to the petals.

A fruit has been defined as the matured ovary and its contents. If we adopt this definition in its literal signification, we have both more and less fruit than is commonly supposed in an apple. Each segment of the core with the contained seeds and adherent pulp to the above described line, is a fruit; but the exterior pulp is no part of the tree fruit. Still we shall do well to make no such distinction when we buy the "fruit" of the apple tree, or when, with or without temptation, we proceed to enjoy the rich stores of the fragrant pulp.

As has been said, botanists disagree as to the nature of the exterior portion of the apple, with perhaps a growing tendency to decide that it is the excavated stem or receptacle and that all that remains of the

Digitized by Google

calyx is the five free appendages constituting the "eye." Possibly the fleshy mass is a combination of stem and modified leaves, but there are certainly some reasons for the belief that the latter have left traces of themselves besides the fibrous tissues in the lines heretofore considered. There are in the pulpy substance numerous fine, branching lines strongly suggestive of the venation of the leaf, best seen in most cases after the cut fruit has been allowed to shrivel somewhat in drying. Some of these cut transversely show dots similar to, though smaller than, the ten regularly placed ones. They are certainly composed of cells like those making up the veins of the leaves and give good reasons for the supposition that the lines are indeed leaf-veins. Then in some apples, for instance, Talman Sweet, and Snow, or Fameuse, there are distinct lines seen on the exterior of the fruit, running from stem to blossom. These are commonly green on what are called self-colored apples, viz., those which have not red coloring in the skin; but are otherwise marked on red surfaces. Often there is only one such a line; not more than five have ever been noted by myself nor by others so far as known to me. Whatever the number, they run into the middle of the sepals at the eye. They are, therefore, by position mid-veins or leaf stalks of the latter. It is true we have found the fibrous tissue of these structures deeply imbedded in the flesh of the apple, but there is nothing to prevent the supposition that the wide separation has come from the enormous development of this fleshy mass. The inside line of fibers and the outside line in the skin may well enough have been parts of the same structures.

Occasionally we find an apple that is apparently made up of two distinct sorts with each kind keeping well its own characteristics. Sometimes a well marked part of such fruits is quite green, while the rest of the apple is yellow; less frequently one section is lightly touched with red while the other parts are deeply colored, or one part is russeted while the other is smooth. These differences may be more than skin deep; it has been asserted that a combination of part sweet and part sour substance has thus been known in the same fruit, but caution is necessary in the acceptance of such statements. Now these curiously marked areas are always in longitudinal sections, and they are sections of one or more tenths, or more commonly one or more fifths, of the entire apple. If we look closely we shall find that the dividing line between the different sections correspond usually to the point of a sepal, that is to the midvein of a sepal, as before explained. When the surface of two or three-fifths of an apple is thus curiously marked, it is found that the boundaries are all determined by the position of the center of the calyx lobes, not as would seem to be most natural by that of the line of union of adjacent leaves. All of one such leaf and the next halves of the two neighbors make two-

Digitized by Google

fifths of the whole, and this division has been observed. What makes this curious structure, or difference in structure, is not known, but there is some connection with the calyx lobes. The positions of the dividing lines show that it is not a phenomenon correlated with the parts of the core, as some have thoughtlessly imagined; if upon other grounds such relation could be assumed. A cherry or peach flower is essentially similar to that of the apple, save that the ovary stands free in the central cavity with its walls altogether separated from that of the surrounding parts. As the flower fades this surrounding wall is cut off at a circular line around the base of the ovary just as leaves are cut off at maturity at the point of juncture with the stem. This indicates that the wall of the cavity is the calyx tube and would settle the controversy were it not a fact that parts of the stem are sometimes cut off in the same way.

Upon the whole the evidence presented and other known facts weigh rather heavily upon the side of the leaf-origin of the exterior portion of the apple and join it in this respect with that of the interior or central mass, and furnish the basis of the statement that when we eat an apple we are in fact enjoying a feast upon a consolidated cluster of ten or fifteen leaves, ten rather than fifteen, because little addition probably comes from the contributions of the petals.

We may now rightfully ask for the purpose of such radical departure from the normal structure, supposing that sometime in the past the change has really taken place. We must seek such purpose in the interest of the plant, not try to make our own desires or necessities the basis of reasoning. We know that plants produce many more seeds than can ever actually develop into structures like the parents; that some distribution of the seeds produced is a prime necessity in order that even a small fraction of them may grow into adult plants. Here is abundant material for a lecture or a book. We can only say now that the devices by which seeds are scattered are wonderful in variety and often very curiously contrived. That they are effective is abundantly shown in the results. For example, a piece of land, originally prairie, had been cultivated for thirty years by a thrifty farmer; then was planted (some fifteen acres) with forest tree seedlings which had been grown in nurseries well away from native timber. It may be assumed that there were no seeds or seedlings present of any woody growth except such as were transferred from the nurseries and set in the rows of the new plantation. The nearest woods were miles away, yet after twenty years there were found in this artificial forest-tree plantation over thirty kinds of trees, shrubs, and woody climbers other than those planted by man. Upon investigation it was determined that every one of those introduced plants bore edible fruits, such as are consumed by birds. Why is it that a cherry

Digitized by Google

when ripe has a conspicuous color, a luscious pulp, a hard stone? Why is it that seeds of the wild crab-apple or thorn-apple are incased in a hard core which is embedded in edible and toothsome flesh? Why is it that apple seeds are wedge-pointed and are slippery when wet? The answers are plain to us all. These fruits are made to be eaten. They are conspicuous in coloring that they may be seen, are pleasing to the taste that they may be eaten, and the seeds are adapted to pass unharmed the ordeals of the digestive process of animals, thus to find chance away from the parent plant for possible growth and development. Man takes advantage of the plastic nature of species and by the arts of the husbandman and the gardener molds their products to suit his own fancy or needs. The wild crab has become in nature's own ways wonderfully adapted, through remarkable changes of form and of character, to its needs, and man has made by imitative processes the orchard fruit from the crab-apple. There is a long botanical story here that can not now be told, though it is one that horticulturisits ought not to grow weary in following. There is in it the encouraging prophecy of better things to come, of improvements of which we see only the beginning, of richness and abundance in the returns from the orchards of which we can now only dream.

But there is another botanical matter that may not be passed in this account of the apple, for it touches closely practical interests now much discussed. It is well understood that the action of pollen is essential to the formation of the apple; no fruit is started, after its first stage of existence, on its way toward development, without the stimulus of fertilization. Seedless fruit of other kinds are more common; but these, too, such as bananas and navel oranges, spring from flowers whose pistils are fecundated by pollen tubes. This latter process is primarily for the production of seed, but secondarily for the development of the attractive substances by means of which the seeds are helped to dissemination. Now the operations of the wonder-working principle of heredity is susceptible of cautious freaks. Here is one: By means mostly unknown to us, the secondary stimulus of the pollen may in particular instances be operative without the first, and this peculiarity, this *lusus naturae*, is perpetuated by heredity. It is indeed thinkable that when once so started the acquired propensity to produce fruit substance without seeds could continue without further aid of pollen, but no example has been observed. When an apple is discovered originating in sexless flowers and developing just as does a potato tuber, we shall have found something thoroughly new in the horticultural world.

Now let us turn to the kinds of action of the pollen upon the embryo itself and upon the accompanying or surrounding tissues of the pistillate

Digitized by Google

plant, the primary and secondary stimulus spoken of above. It is matter of common knowledge that the embryo partakes of the nature of both parents, that pollen from a characteristic source impresses itself and its peculiarities upon the progeny. But the embryo in an apple is wrapped up in a fertilized seed. Are these pollen characteristics also impressed upon the parts we commonly call the fruit? Are either the papery parts of the core or any portion of the exterior pulp modified by the pollen in such manner as to partake of its quality? All biological science answers, no. Yet we have seen that the exterior substance, as in the case of a navel orange, may develop without the accompanying production of an embryo or the formation of a seed. Recently, too, it has been clearly shown that certain fruits, including some apples, which do commonly produce seed, through the influence of their own pollen, become noticeably larger and sometimes different in shape when fertilized by foreign pollen. Where, then, is our biological science and its universal negation?

The puzzle is not so hard as it seems to be, but the evidently correct solution has had little exposition. Let us see if it can now be stated.

When the pollen tube grows down through the tissues of the pistil it carries with it a cell-nucleus which has come to be known as a very definite and easily recognized structure, through the methods of the modern botanical laboratory. This particular, well-known, individualized bit of protoplasm actually coalesces or blends with another individualized and equally well-known and separated bit of protoplasm in a particular cell formed in the tissue of the ovary during the development of the flower. These two minute but readily studied structures form one compounded body from which, by regular and also well-understood processes of vegetative growth, the young embryo is solely derived. This embryo is in very fact and substance part and parcel of the two generative nuclei, and it includes them entirely; there is nothing left of them to unite with anything else. There is to be sure a second, something similar and also well-known, nucleus sent down by the pollen tube, and this, as has been recently found, has another office in forming the nutritive tissue immediately surrounding the embryo, and rationally explains the effect of the pollen the first year, for instance in a grain of corn. But this action is definitely known to extend no further than the embryonic structures. The outer layer of the corn grain are transparent and may permit a changed color within to show through; but these outer layers, the hull or bran, of the grain are in no sense modified. This outer portion of the corn corresponds in part to the shell of the apple seed, which is certainly beyond the influence of the pollen in any way analogous to that upon the embryo within, as are all structures exterior to it. It is not saying too much when it is asserted, and with the utmost conviction

Digitized by Google

of truthfulness, that no apple ever showed in any part or over the whole surface, inside or outside, any indications as of color, russeted skin, shape, flavor, etc., as an inheritance from a pollen-producing variety, many loose assertions to the contrary notwithstanding. This is strong language, but it is all meant. The matter is one upon which a botanist may confidently make strong expressions and composedly rely upon the ultimate issue of a controversy.

Still foreign pollen does make in some cases, as has been said, a difference in fruits externally considered, a difference plainly recognizable as different from the typical production of self pollinated flowers. So too, simply cutting off a twig from an old, slow-growing geranium, and starting this cutting by florists' methods, makes a young plant, a rejuvenated plant, with the characteristics of a young, rejuvenated plant. The leaves are larger, the growth is more rapid, the stem more succulent, the flowering propensity less pronounced. But otherwise the peculiar, innate characteristics of the old plant are all represented in the new one. It has no new elements of form, or color, or fragrance, or habit; it is simply young. Now the differences noted as due to foreign pollen on fruit are all such as are connected with stimulated growth, a pure and otherwise unmodified acceleration of development. This is the sole effect of pollen of any kind, from any source, on the structures exterior to the embryo and to the so-called endosperm of the seed. It is a secondary stimulus and a consequent activity of growth, whose peculiarities are inherited like other specific characteristics of an organism. If this is the role generally of fertilization upon the exterior fruit structures, we should be well prepared for a difference in the amount of the stimulus and of consequent growth due to different kind of pollen. Read Waite's and Fletcher's bulletins, from the presses of the Department of Agriculture at Washington and of Cornell University in this light, and see how rationally comes not only the evidence of modification but the satisfying explanation thereof. The whole subject is one to be commended to the fullest and most careful consideration of the practical fruit growers, as well as to the botanical investigator and theorizer.

Here we pause. What is an apple? Something good to eat; something inviting, satisfying, health-giving—but more. It appeals as strongly to man's mental and moral natures. There is in its make-up something inviting, satisfying, health-giving to the mental appetite and intellectual digestion; it bears lines and marks engraved more durably than by chisel upon granite from the everlasting hills, by the Supreme Author of all being, and made intelligible and inspiring to all who rationally and reverently read.

[Note.—The lecture was illustrated by enlarged drawings upon charts and frequent reference was made to these illustrations in explanation of

Digitized by Google

the text. The reader will do well to cut apples in halves both crosswise and lengthwise and to study these in connection with the statements made by he author. Compare also other fruits mentioned.—Secretary.]

DISCUSSION.

Mr. Tilson: I think this is one of the most remarkable essays I ever heard, because I couldn't understand any of it. He says the apple is nothing more than a leaf, and describes the apple and the leaf as one and the same. But the apple may be sweet and the leaves never sweet. All leaves taste alike.

Professor Burrill: I have sometimes gnawed a cornstalk and have found it to be sweet. There is no sweetness in leaves, but the thing that has made that sugar and starch was manufactured in the leaves. Over in Peoria they have a process by which they turn corn into sugar in large amounts at the glucose works. In the same way the plant produces sugar. The leaf during the daytime and in the sunshine is hard at work manufacturing a substance, not sweet but starch. During the night it turns about its forces and changes the starch into sugar and sends it down in the stem. That is there as a liquid. This is the laboratory of the plant. That same thing is going on in the apple leaves.

Mr. Tilson: It makes the starch in the daytime and the sugar at night?

Professor Burrill: It can not make starch in the night and can only make it in the sunshine. I have heard talk about some plants going to sleep. They never go to sleep. Some folks say corn grows faster at night than during the daytime; that is the fact.

Mr. Campbell: Why is it that the same variety of apple grown on different trees and in the same soil have different flavors. Take the Ben Davis apple, and I know of several instances where these apples have looked alike but don't taste alike.

Professor Burrill: I was down in Wayne County, Illinois, a few days ago. There were some apples on the table, and I thought I knew Ben Davis apples very well. I looked at a plate of apples labeled Ben Davis. They didn't look to me like Ben Davis, and I

Digitized by Google

asked to taste one, and I did so, and it did not seem to me it was Ben Davis. They were better in quality than the Ben Davis with which I am familiar. They were Ben Davis apples. The difference was in the soil and some other things by which they were surrounded. I am not saying either that apples will not be different on different stalks. The Ben Davis would be a Ben Davis always, and if you take a scion from that Wayne County Ben Davis and put it on a Champagne County stalk it will grow a Champagne County Ben Davis, of the type I am familiar with.

Dr. Preston: I would like to ask what relation the size of a blossom or flower has to the size of the fruit. I have observed the growth of peach blossoms. I have in my yard six trees, and the trees that had the largest fruit had what I supposed imperfect blossoms. The petals on those trees were small but the fruit was large and almost perfect. The trees that had the largest blossoms and the most beautiful blossoms had the most undesirable fruit, small an no account.

Professor Burrill: I have a Bartlett pear tree and a Clapp's Favorite at my back door. The Clapp's Favorite blossom is a beauty by the side of the Bartlett blossom. This is characteristic of the Clapp's Favorite pear tree. I don't think there is any relation between the Clapp's Favorite blossom and that of the fruit produced as correlated or connected. Yet I should infer that the Bartlett that produces large flowers would likely produce large fruit. If the tree was in such a thrifty and vigorous condition as to produce a large flower I should think it would produce large fruit.

Mr. Burton: What has been your experience with bitter rot this year?

Professor Burrill: I am very sorry to say we had a very sad experience. We did a good deal of spraying this year, and it was done just after the leaves came out, just after the petals had fallen. This spraying was done about the closing day of April, and none later than the middle of May. We put a good deal of labor and expense into this spraying. Orchardists that have had no fruit for years looked forward to an abundant harvest. The trees were in

Digitized by Google

better shape than they had been for years. The young fruit held on better than ever. Along in July and August the bitter rot and other rots associated under that head in many cases took the entire crop. One man who had figured he would have 1,200 barrels of good fruit found that he had ten. It was an awful thing. A man in Johnson County, who had been advocating the planting of orchards for the last twenty years, said he was so thoroughly disgusted with the loss of his fruit after it was almost half grown that he was talking about cutting his orchard down and raising red-top grass, that is putting it in meadow. So far as I know, there is no settled method of preventing this rot of apples on the trees or after they are picked. One man sprayed with Bordeaux mixture, and he shipped to Champagne some of the most beautiful Winesap apples I have ever seen. I think spraying can be used as a preventive against the rot, but not as a cure.

Mr. Tilson: Are you right certain that the spraying did not cause part of that bitter rot.

Professor Burrill: I would hate to charge it to spraying.

Mr. Tilson: I did some spraying this year, and had the worst lot of apples I ever had.

Professor Burrill: That is an unfortunate condition that has occurred quite frequently. We have a boom in apple growing in a little place in Illinois called Neoga. It is north of what is usually thought to be the best apple district. There have been several people there who have grown apples for a considerable length of time and yet one man started in there to cultivate and spread out to the limit of his knowledge. He is a very energetic man, very thrifty in every way, and he certainly has done wonders in his orchard and he has put a good deal of it down into his pocket. Now the neighbors said of him, "Mr. Aldrich is only lucky. He did not spray at all. He has a good crop of fruit, and another man who did spray, has not." That kind of thing happens; but taking one time with another, those who have not sprayed have not got as substantial a bank account as the man who has persistently done it and kept at it. I can not help but think that there are a good many of these things hidden away from us and which we do not

Digitized by Google

see on the surface. Of course the spraying may do damage; it may burn the foliage if the substance is put on too strong and all that, yet still I think it is useful in preventing bitter rot.

Mr. Reed: How late in the season has the spraying been continued in those experiments in Illinois which have been most successful.

Professor Burrill: Right along until the harvest time of the apples.

Mr. Reed: The reason I ask that is because I heard Mr. Stinson's paper on bitter rot in Missouri week before last. It has been successful there, and until the first week in August he had sprayed five times.

Professor Burrill: This man I quoted as having raised Winesap apples, kept it up later than he need to have done.

Mr. Reed: Wouldn't he have to spray every time after a rain?

Professor Burrill: Well, I don't know. The best time to spray is during the rain, but that isn't common doctrine.

The President: That is a new doctrine here. You may have to prove that before you get away from here.

CROSSING AND HYBRIDIZING.

BY FRED DORNER, LAFAYETTE.

Crossing is the pollenizing of a flower of one variety with the pollen of a flower of another variety of the same species to effect fertilization. Hybridizing is the same action between two species of the same genus. A crossing between two genera may be possible where relative properties exist.

Nature teaches us that cross-fertilization strengthens the vitality and advances perfection in the progeny, while a self-pollenization degenerates. In many plants the flowers are so constructed that a pollenization is only possible with the help of insects, by carrying the pollen on their hairy bodies from one flower to another, or the pollen is carried by the wind. We notice where plants stand in clusters, seed is more freely produced than when standing alone. A solitary cornstalk seldom produces a good ear of corn.

Digitized by Google

With the knowledge of nature's wonderful and intricate working we are enabled to extract from her what we receive otherwise only by chance. The production of new varieties, improvements on existing ones, in fruit, flowers and vegetables as size, form, taste, fragrance, color, habit, productiveness, beyond the result of good culture can only be accomplished through the seed produced by cross-fertilization.

The most striking illustration we have is the carnation. With a good culture as a basis, and a judicious selection for crossings, greater improvements have been accomplished in the past decade than the century before, when the most achievements in the evolution of this flower had come mostly by chance. What has been accomplished here can be done with any other genus of plants, be they flowers, fruit, or vegetables. In France and England wonderful improvements have been made in the rose; there were also made the initiatory improvements in the carnation, which has come to its highest standard in this country. Germany took the lead in annual and perennial summer flowers, while in fruit the French are the peers.

For illustration, I will give you my experience in carnation culture, and first call attention to some natural laws governing reproduction, favorable and unfavorable to what we want to accomplish in our crossings, mention points to be observed and describe the procedure of pollenizing to effect fertilization.

To make it more comprehensible, we must go back to the original primitive pink, the ancestor of the pink family. To all appearances, the flower of the original pink has been single and of a purplish pink color. Culture made the first improvements; it produced the double flower. This has probably been preceded by shadings in the color; spots may have appeared of distinctly different colors, and then nature's work of cross-fertilization enlarged what culture had effected in the beginning. Varieties developed so distinctly in habit, that they were classified as new species. The remontant or ever-blooming variety originated in France about seventy years ago, and from this type developed our present carnation, much improved in habit and free blooming. It required centuries to develop our present monthly or ever-blooming carnation. Now in our artificial crossing and hybridizing we employ culture, selection and calculation, but we have against us the natural tendency to breed back to its primitive originality, and all the intervening stages in its evolution up to the present time. Culture is the fundamental base; neglect it and you will assist the natural deteriorating, the return to its primitive condition, or what we commonly call "running out."

In the selection of the parent flowers we must exercise the utmost care to select the most perfect, as well in the pollen or male parent as

Digitized by Google

in the seed bearing or female parent. I will give an illustration from my experience in regard to selection and calculation. Ten years ago when I commenced to make my first crossings, I used as parents the best standard varieties then in cultivation. Among these, the most vigorous growers we had in the pink, scarlet, dark red, and variegated varieties; the pure white lacked constitution, and a few yellows were weak and shy blooming specimens, and of a very light shade and poor imperfect flowers. The yellow color was there, and my aim was to produce a clear yellow variety with perfect flowers and a vigorous constitution. The first step was to infuse more vitality, a more vigorous, robust growth; in this I succeeded by making repeated crossings for the next three or four years between the yellow seedlings and other strong growing varieties, but the stripes of the color of the pollen parent were always there, and where they appeared the most I noticed the most improvement in habit, and where I used the scarlet varieties I also noticed that the yellow color became deeper and more pronounced. Now I had some good strong growing and free blooming yellow varieties, but they were all striped. The next step was to eradicate the stripes; this I accomplished by crossing the least striped varieties with the more profuse striped ones, and with some brilliant scarlets, and some mongrel colors between yellow and scarlet, that appeared with the striped yellow. This I had to continue for several years again, and now at the present time I can show some yellow varieties of a pure clear yellow color, much darker than the yellows of ten years ago, which were rather more a cream, and with as strong constitution as we find in any of the other colors.

To give an idea of the importance of such work, I can truly say that among ten seedlings probably one showed progressive improvements; the other nine went backward; and then I had my selection among hundreds. In all our contemplated work we very seldom succeed with the first crossing; it generally takes three and four generations to accomplish what we aim for. In general, we may say that probably one in a hundred will come up to the standard of the existent varieties, and probably one in a thousand will be better and above the standard. We recognize nature's law that like produces like, but in a plant like the carnation, that has been for centuries under the influence of culture and cross-fertilization, it will hold good only in a general way, when we consider the results of our crossings. The strong tendency to retain its primitive originality is there and is stronger than the agents we employ to force it away from it, and naturally the results of crossing are very various.

The retrograding results are most plainly shown in the large percentage of single blooming plants, from 25 to 50 per cent.; then we find plants that have lost their ever-blooming quality, with a more grassy

Digitized by Google

appearance resembling more our common hardy garden pink. In color we find the greatest instability; while most plants from the same seed pod will have the color of one or the other parent, or both, there may be a goodly number of entirely different colors. It is not uncommon to see a progeny of two dark red varieties to be a pure white, and vice versa, but when I consult their pedigree I may find that color three, four or more generations back. Then we may find the garden carnation only blooming through June and July, from which our ever-blooming present carnation descended. On the other side we find a few specimens where culture oversteps its function and produces flowers with ten times the number of petals, very large, often measuring six inches in diameter, ragged, without form and beauty. In the structural parts of stem and flower we may find diversities not found in either parent.

Lastly, I will mention some plants where nature refuses reproduction, being imperfect in their sexual organs. Several of my best varieties never produce a single grain of seed, with the most careful and repeated pollenizing, while some others are entirely destitute of pollen but produce seed freely when pollenized. With others pollen is sterile.

The sexual organs of a flower consist of the stamens with the anthers or pollen bags containing the pollen, the male organ; and the pistil, the female organ, comprising the ovary containing the ovules or small unfertilized seeds, style and stigma. The procedure of pollenizing is purely mechanical and very simple. To make a crossing, select the flower that shall bear the seed, before it is fully developed, and remove all the stamens; this is done so there is no chance for any possible self pollenizing. It is also well in double flowers like the carnation to remove part of the petals around the pistil to give this organ a freer chance to develop and be of easier access to apply the pollen. When the pistil is matured enough to receive the pollen, which can be easily detected with a little experience, apply with a small fine camel's hair brush the polen with a light touch to the stigma. The pollen is ripe when the anthers burst and lay it bare, and when not too old and dry will readily stick to the brush, the same as to the fine hair of a bee; to moisten the brush by breathing over it will help much to hold the pollen. Fresh pollen is always preferable, than when too dry one or two days old. The morning hours on a sunny day is the best time, and we seldom fail to find fresh pollen at that time. A low temperature and wet atmosphere will prevent fertilization. A matured flower prepared for pollenization retains its freshness and vitality for several days, while pollen will soon be scattered and lost with the slightest touch. I found with the carnation that flowers kept for two weeks and were then yet in condition to effect fertilization and grew seed.

Digitized by Google

I am not advised to what extent artificial crossing in fruit culture has been practiced in this country. Whether our newer varieties of apples, pears and other fruit are results of carefully executed crossings, or found by chance or imported. We have delicious fruit; we have also exquisite flowers, but something new always enlivens the flower market, gives new interest to the lovers of flowers, and we feel a beneficial effect through the whole trade. Will it not have the same effect in fruit culture? It is quite a greater undertaking to grow fruit from artificially grown seed, than flowers in the same way, from herbaceous plants; here we can see the results in a year or two, while in some branches of fruit culture we have to wait three or four times as long. It would hardly pay to grow 6,000 seedling apple trees, like I do carnations, wait six or eight years, and then find probably a dozen that may be better than existent varieties. It would truly be a hard experience to see one-third or more return to the wild crab. Fruit culture is in this respect much the same, as the culture of our varieties of flowers, that have been grown for centuries; we meet the same obstacles to a more rapid progress, the tendency to breed back, a dealing with inferior conditions of long age. I speak more of the apple, as it is probably the most widely spread. With small fruits results can be ascertained much sooner.

I believe most all of our native varieties of apples, old and new, have accidentally been found in the nursery row among the large number of seedling stock grown for the purpose of grafting. They may have probably attracted attention by some characteristic shown at that age and were saved out of curiosity, or they were probably found in some corner or out-of-the-way place where a stray seed had grown and were left alone. As I said before, to grow seedlings for the purpose of producing meritorious new varieties on a large scale would be neither profitable nor encouraging. Let us lay dollars and cents and large profits aside, and see if such work on a small scale successfully carried out would not be repaid in the work itself, the pleasure it gives to dive a little into nature's mysteries, and watch and see what you can accomplish, and it may be profitable in the end. Suppose one would grow a few apples in his orchard from select crossings, use the seed of the best specimens for sowing, and keep a correct record of all his crossings. A like number of seedlings can be grown every year to fill another row in the space devoted to that purpose. When the seedlings are ready to transplant, do not plant them in some out of the way place and leave them to themselves. If you can not spare a piece of ground suited for apple culture do not attempt the work at all. A good culture will help and sustain what you want to accomplish, it is imperative. The young trees will not need the space you would give in a permanent orchard. They should have

Digitized by Google

ample room to develop until they bear their first fruit, but give all the care and cultivation a rosarian would give a bed of his choice roses. As your work progresses and you add every year another row to your proteges, when you see them thrive and respond to your careful cultivation, notice their different characteristics, make comparison with their parents with the aid of your record, indulge in suppositions as to what may be the result, see the first blossoms appear, their first fruit ripen, and find probably one, two or three varieties that are above the standard —then you will realize the fascination this work has, and the satisfaction and pleasure it gives. But I say again, this is only work for one who has love for it and feels himself repaid by the pleasure it affords, and let the business part follow.

Now some may ask how to proceed with such work. I will try to outline a way as it appears to my mind, but can certainly be improved upon and suited to circumstances. Make your plans as to what crossings you wish to make and select some branches of easy access on the healthiest trees of the desired varieties that have a goodly number of sound fruiting buds. When the flower buds appear and attain that rounded form ready to break open, select the strongest and healthiest, as many as you will use, and remove the rest. Clip part of the petals away, so as to have freer access, and remove the stamens; this must be done before the bud opens, in order to remove the pollen before it is ripe. When the pistils of the prepared flowers are matured apply the pollen that will be found now abundantly on the other parent tree in the same manner as described before. During the time of blooming it requires the greatest watchfulness to guard against detrimental influences until the fruit is set. In the first place we have to protect the prepared flowers from the insects, which, in quest of honey, swarm over the tree and perform unwittingly and promiscously as arranged by nature, the work you wish to do yourself to suit your fancy. For protection use a fine gauzy fabric that will not shut out light and air, and enclose either the whole or part of the branch or the single flowers, just as it is most convenient. This will also protect against flying pollen carried by the wind, and if left on during the early growth of the young fruit, will protect against the ravages of winged insects. If the pollenized flowers can be protected from rain, it will be of much benefit, as water will interfere with fertilization. A correct labeling should never be omitted, if one is deeply interested in his work. This is not such an extensive or tiresome work as many suppose it to be, neither complicated; all that is required is timely attention. What can be done in Europe can be accomplished here, too, but one must have love and energy for the work, use his brains and not his pocketbook alone.

Digitized by Google

CONDITIONS AFFECTING APPLE GROWING IN THE GAS BELT.

BY MRS. W. L. BERRYMAN, TIPTON.

This subject presents four propositions: Soil, climate, parasites and market. I take it as a settled proposition that some soils are adapted to the growing of apples, while other soils, although fertile for many other plants and shrubs, are not best for apple culture. The apple tree in texture and fiber is more like the sugar, beech and hickory trees than any of the other fruit trees. Hence we would expect the best results from orchards growing on this quality of land. Experience proves this to be correct. The black soil of our level lands, however, under proper treatment, will grow strong, thrifty apple trees, and with fair treatment will be prolific and produce a good quality of apples.

The soil in the gas belt is largely black, alluvial in character, and having at one time been swamp, must of necessity make a very level country. Therefore, there is but little of the high, rolling land known as sugar tree land for apple culture. This condition is against the interest. The black land, however, has some advantages. As a rule it has a good strong clay subsoil and is susceptible of thorough drainage; it is especially rich and refuses meager fertilizing. These qualities are of vital importance; no apple tree can be healthy and productive whose roots are continually immersed in water. Again, subsoil will generally prove a disappointment to the apple grower, no matter how good is the surface, from the fact that the trees will not be properly nourished in the gravel and it will not furnish a sufficient support to protect them from being overturned by windstorms.

The level feature of our country subjects the orchards much more severely to the influences of cold and winds than does one of a hilly or more broken character. This disadvantage, like the excessive moisture, can be remedied by artificial means. A good strong wind-break on the west and north, either of natural or artificial forests will largely protect the orchard; hence, we conclude that while the gas belt in point of topography and soil is not of the very best for apple culture, its defects may to a good extent be overcome and made to produce. The next environment is the climate. This belt is a quasi prairie country. It is too far away from Lake Michigan to receive any of the salutary influences that orchardists derive from the presence of large bodies of water. We appear to be outside of the snow belt, and it is a rare thing that there is even good sleighing. Northern and southern Indiana enjoy the benefits of more snow during the winter than the gas belt. The temperature in both northern and southern Indiana is more even than in the gas belt, where the extremes of heat and cold follow each other in rapid succession.

Digitized by Google

It is not an uncommon thing in our winter after a few days of almost spring-like weather to have the mercury drop to ten or twelve degrees below zero, and occasionally to twenty and twenty-five below. These cold waves are usually ushered in by a raking wind that calls to one's mind, when aroused at night by the rattling of windows and creaking shrubbery, the night described by Burns in his Tam O'Shanter, "Sic a night a chile might understand, the Diel haid business on his hand." It is not only in mid-winter that the apple and the embryo apples are injured by the winds like all prairie countries, but we are especially subject to wind storms during the summer. These facts make it important that we not only protect the orchard from the rigor of the climate, and the winds as suggested, but also that fruit be selected that is least subject to injury from these summer storms.

Varieties of trees that grow tall, have stiff, springy limbs and whose fruit grows on a short, stubby stem are much harder to protect from the wind than varieties of the opposite characteristics and whose fruit grows on long limber twigs. The Vandevere and Bellflower are of but little or no profit in this district because of their susceptibility to injury from wind. They are sufficiently hardy to withstand the rigor of the climate, but their physical formation makes them special objects of the sports of Old Boreas. We find the winter varieties that give us the best results to be Ben Davis, Grimes' Golden, Willow Twig and Baldwin. Again by proper care and proper selection of the varieties our climatic defects as well as parasites can successfully be overcome. Yes, the gas belt has her full share of these pests. We have those that attack the tree, and those that attack the fruit. It would make this paper too long for me to attempt a detailed account of them or the remedies against them. I shall content myself by stating in a general way that washing the young trees in strong soap suds and keeping all grass and weeds from the roots of trees will prove exceedingly beneficial. Proper spraying is probably the best protection to the fruit.

Markets: One of the most important conditions in the growing of any crop is to know that you have a profitable market for it when produced. The diamonds, gold and precious stones as described in Haggard's story of King Solomon's Mines were of but little value to those who were locked within that subterranean vault. There was no market for them, they could not be utilized. The farmers of the gas belt have heretofore felt much the same about apples. Accustomed to farming on a large scale and selling their products in bulk their education has been against retailing or peddling any of their farm products. With the present condition of the apple orchard of this district, this peddling was necessary if the surplus was disposed of. A large per cent. of the in-

Digitized by Google

habitants of this district came directly or indirectly from southern Indiana, Kentucky and Virginia countries, where the orchard nestled behind protecting hills which gave tree and fruit alike immunity from the destructive forces of the wind and cold. They came to this country with the taste of the luscious Vandevere, Bellflower, Rhode Island Greening of their boyhood home lingering in their palates, they consulted those tastes and not conditions when selecting their orchards, and failure necessarily followed. The conclusion was at once reached that this was not an apple growing country and therefore those setting out orchards at all put them out only with the view of producing apples for domestic use. I regret to say in most instances those orchards were planted without regard to proper methods and were largely left uncultivated and uncared for; like "Topsy," they just growed. "Scientific" and high class farmers that fully realize and appreciate the advantage of thoroughly draining and fertilizing our soil in order to reach the best results in other crops seemed to think that an apple tree should thrive on wind and water and totally neglected to drain and fertilize their orchards. Let me again emphasize at this point the importance of fertilizing. Throw in your orchard all classes of fertilizer that would make your land produce an abundant wheat crop, feed your trees and feed them well, and they will repay your kindness. These conditions have not stimulated the market in this belt.

Buyers go to the locality to purchase commodities where such commodities are produced in large quantities and of high quality. It is no unusual thing in this belt to find commission merchants from Boston, Buffalo and Chicago and New York buying herds of cattle and horses. The same inducement in apples would bring the commission merchant to purchase apples. This is not theory; it has been demonstrated. In my own county we have but one extensive apple grower. Mr. John Puckett, who is one of our largest land owners as well as one of our most successful farmers, has about twenty-five acres in orchard. I only know the result of this orchard financially during the last two years. Ninety-nine was only a fair crop. This year it was meager. He sold in '99 his crop to a commission merchant and delivered in the orchard nine miles from the shipping point, and received something over $1,700 net. This year he sold in bulk and delivered in the same way, receiving something over $400. No quarter section of his choicest land used for agricultural purposes has yielded such results during the last two years. The apples he produces are Ben Davis, Willow Twigs and Baldwins. It is easy to see that apple culture even under our adverse conditions, with the many cities in the gas belt, Indianapolis and Chicago for markets will pay. There is ample room for eighty trees on an acre of ground. With

Digitized by Google

a general yearly average of four bushels to the tree, which is a conservative estimate, gives a yield of three hundred bushels per acre. These at the low price of 25 cents per bushel in the orchard brings a yearly rental of $80 per acre, and your land is worth almost as much per acre for pasture as if the trees were not upon it. When the same push, hustle, intelligence and enterprise is put in the apple industry in the gas belt that is expended in other lines of business in that locality the apple culture will be profitable.

On motion of Mr. Swaim, the President of this association is empowered to appoint a delegate to attend the American Pomological Society.

The following discussion was made by Amos Garretson of the paper read by Mrs. W. L. Berryman on the conditions affecting apple growing in the gas belt:

DISCUSSION.

In discussing this excellent paper, one hardly knows where or how to begin.

She says we may expect the best results from apples grown on sugar, beech and hickory soil; this I think is true with most varieties of apples. My soil is mostly sugar-tree soil. I have a row of Stark trees across the orchard. At one end of the row the land is higher, gravelly and naturally dry. The other end of the row is of black burr oak land, clay subsoil, naturally wet land, but well underdrained. We get as many apples from the tree on the higher land as from the tree on the low land, but not more than half the number of bushels, and they are not worth more than half the price of those on the black land.

I think one should be very careful in planting an orchard, to set trees that would be best adapted to his soil. The lady says the Vandevere and Bellflower are of very little or no profit. Why is this the case?

The Vandeveres of forty years ago were always loaded. The oldest trees I know of now are Vandevere over fifty years old, and they bear good crops with the poorest kind of care. I do not know of Vandevere trees of ten to twenty years that are profitable; have often wondered why it is so. In Mrs. Berryman's selection

Digitized by Google

of winter apples I think she has omitted two of the very best varieties—Jonathan and Stark—both of which do well on black burr oak land.

The plan of washing young trees, and the old ones too, with strong soap suds, can not be too strongly emphasized. I have had experience along this line, and know it makes the trees look like they had put on a new Sunday suit. The majority of farmers in the gas belt, yes, nine-tenths if not nineteen-twentieths of them, think it will not pay to set an orchard; they say if it is a good year for apples, they are cheap; if a poor year, it does not pay. So he gives his attention to corn, hogs and cattle, or corn and wheat, and sells the grain. It is my opinion that the tenth or twentieth man who sets an orchard with the best varieties adapted to his soil, and takes the best care of it, giving proper pruning while young, and every year thereafter, keeping land well fertilized, thorough and continuous shallow culture, will find that money does grow on trees. Our friend has just demonstrated the fact that a good crop of apples at the very low price of twenty-five cents per bushel would bring a yearly rental of $80 per acre, all that the land is worth for corn, wheat or hay. I can not quite agree with Mrs. Berryman in her statement that the land is worth almost as much for pasture as if the trees were not on it. While this may be the case, it would certainly be a detriment to the orchard to pasture it. In fact I think an orchard should not be in grass of any kind unless it is occasionally set to clover, let grow and seed, then plowed under the following year.

It would not do for us to plant large commercial orchards, or we would surely overdo the matter, which is but natural for us American people. A few years ago you could hardly run fast enough to give away a small (or driving) horse, now a good driver is in demand. The same can be said of beef cattle, shorthorns, Herefords, etc.; in a few more years they will take another tumble. Why? Because a great majority of the farmers will jump into what pays best at the present time. This will not likely be the case in apple growing, as it will require much study, great care and lots of patience, and but few there be who will follow it.

Digitized by Google

Prof. H. E. Van Deman addressed the Society, and extended to them an invitation to make an exhibition of Indiana fruits at the Pan-American Exposition in 1901, to be held in Buffalo, New York.

SITE, SOIL, SELECTION OF VARIETIES, PLANTING AND CARE OF AN APPLE ORCHARD FOR THE FIRST TEN YEARS.

BY PROF. W. J. GREEN, OF THE OHIO EXPERIMENTAL STATION.

I do not know just how you feel in Indiana, but in Ohio they want us to present something new every time. I can not give very much that is new. Perhaps I might call that a good excuse. There hasn't been any discovery in recent years that you might say is strictly new. There are a great many differences of opinion to be sure, but I must content myself to thresh over old straw, and all that I can hope is that I may throw out a few ideas which may be helpful to some. The soil and site of an apple orchard are important questions, but if a man is going to plant an apple orchard on his own farm he has not a great deal of room for choice. He is confined to such soil as he has, and the only way he could do otherwise would be to buy a new farm on which to plant an apple orchard, and not very many are disposed to do this. Yet it is a matter we can not neglect very well. If a person has not got the right kind of soil and does not choose to buy a farm for that purpose he had better not plant an apple orchard, at least not for commercial purposes. It is not an easy matter to define just what kind of soil is best for an apple orchard. The fact is that apple trees will thrive on a great variety of soils, a greater variety than we commonly suppose. There is really more in management than in soil after all. I would choose high, well drained clay ground, if possible, one that will grow good wheat. What has been spoken of as sugar tree soil is usually about the best kind of soil for an apple orchard. With regard to the site, it has been in the past almost the unanimous opinion that apple trees ought to be planted on high or lofty sites, but that opinion has been modified considerably. I am sure I would not undertake to make a general statement with regard to this matter because I have seen good apple orchards planted on low lands, on lands of medium elevation and on high lands, and all doing well, and I have seen them planted in all kinds of locations doing poorly. Yet we can not neglect to do the best we can in the selection of both soil and location. I think there is but little doubt that apples color better on high land, and there is but little doubt, too, that they are later in ripening and hang on the tree better on rather low land. There

Digitized by Google

are some varieties, like the Rome Beauty, that seem to be particularly adapted to high land, and must have a high elevation to do well, and yet since the advent of the spray pump we can raise fruits on lands that we could not before, especially on low, flat land. Speaking of the Rome Beauty, it is very subject to black spot on low land. In fact, in southern Ohio it has come to be the common belief that the Rome Beauty can not be grown except on hilly land. Since the advent of the spray pump we have had to modify these views. We find it growing in a great many places where we formerly thought it would not grow. There are some things, however, I believe it is well to avoid, and the first is land that can not be well drained, and I would much prefer soil naturally well drained to soil which I am compelled to drain. If we can secure good drainage by artificial means that is next to natural drainage. I need not say much more about drainage, because it has been talked of so much we all thoroughly believe in it. I will speak of one thing that may be new to some of you—at least you may not agree with me. I believe that we have made a mistake in the past in planting orchards too often on dry soil, or soils where the moisture was deficient at a critical time in the life of the tree. I believe that a great many of our orchards when planted on high locations have perished, not only in winter but in midsummer. My attention has been called to this particularly because of some experiments that have been made along the line of cultivation. I have seen orchards completely killed by drought in the winter time, trees planted on high and dry soil where they couldn't get sufficient moisture when the ground was not frozen, but when the ground was very hard frozen they couldn't get any at all, or at least not sufficient to keep them alive. Orchards have perished in this way in southern Ohio and other parts of the State. All over our State comes complaint about apples ripening too early in the fall. It seems that they always think each season is an exception in that particular. Then comes the complaint that they don't keep well. They are dropping from the trees too early and then when put in the cellars and storage rooms and having ripened prematurely they begin to decay. I am positive this is caused very largely by the planting of our orchards on very high and dry land and neglecting to take care of them. The reason I think so is that our orchards where they have been cultivated properly the fruit does not ripen so early as where the trees are not cultivated. If the cultivation has been kept up during the season and through the dry and critical time we find that fruit does not ripen so early, that it hangs better on the trees, and in consequence it keeps better. We have, in Ohio, one case in particular where a large orchardist practices mulching and on a large scale and a number of others who do it on a more limited scale. I know of one orchardist hav-

Digitized by Google

ing forty acres in apple trees which he mulches. He planted the trees in an old pasture. He didn't plow the ground. He believed that he could plant his apples trees in this pasture and grow them as well as he could by means of cultivation. When I first saw the orchard I was quite confident he would not succeed. These trees when I first saw them were about six or seven years old and they were not as large as trees ought to be at that age. Yet they were in a good, healthy condition. In planting his trees he began in the fall and winter, whenever he could work, and dug a large hole, throwing the soil out in a heap. He did so in order to expedite matters in the spring and because soil thrown out in that condition would be dry very early. He began planting so early that sometimes when he went to plant a tree he would have to bail the water out of the hole. Then he set out the trees and enlarged the hole to about five feet across. Then every year he dug up the soil and kept it clean. Soon, however, he began to mulch with coal ashes. He mowed the grass between the rows of trees and took it away. When the trees got about ten years old he began to think that was not a good plan, that his trees needed not only a little more fertility but he was taking too much away from them and he couldn't expect good results.

A Member: What kind of grass was that?

Professor Green: Blue grass.

He wrote and asked if I thought it best to mulch the trees. He said he had got about to the end of his string. He felt that something ought to be done. He asked about mulching, and I told him I thought it would do, but I thought he must keep it up if he once commenced it, and that he could not leave it off, at least not all at once. The result has been in that case remarkable. He not only secured large crops but he has taken care of his trees by spraying and in other ways. His apples always hang on longer than on any other orchard, and I do not believe there is an orchard in Ohio doing any better to-day. Last year he got seven thousand bushels from trees mostly about ten years old. This year he got four thousand bushels. Of course he got good prices, for the apples were large and fine. Last year there was a heavy wind that blew off a large number of apples in the State. Last fall the Galveston storm swept through his orchard and blew off about three hundred bushels. His apples do not mature like other apples. They hang on the trees until late, so late that hard frosts come before they are picked. This makes me think that our apple trees are suffering for want of moisture and that causes so much premature ripening and early decay of fruit. However, I would not attribute it all to that. In selecting a site for an orchard I

Digitized by Google

would avoid all high and dry locations unless I expected to adopt means to correct the deficiency of moisture.

Professor Van Deman: What do you use as mulch, and do you cover the entire surface of the ground?

Professor Green: He simply mowed the grass between the rows of fruit trees and threw the grass around the trees as far out as the limbs extended.

Professor Van Deman: The rest of the ground is in grass?

Professor Green: It is all in grass, but under the trees there is no grass; that has been killed off by the mulch.

Professor Van Deman: Does he pasture?

Professor Green: No, sir.

The President: Why don't he cultivate it instead of mulching; is it rolling?

Professor Green: The ground is somewhat rolling, and part of it he could not cultivate. He believes that cultivation is not best on this soil.

President: Where is that?

Professor Green: That is Mr. Vergon of Delaware.

I might say with regard to this orchard that it is located on soil that would not be considered the best for such a purpose. It is about twenty feet above the river, not on high land. He has done some under-draining but not a great deal. I am not prepared to advocate Mr. Vergon's plan of not doing any cultivation. However, if I had a site suitable and in the timber I would just as soon clear off the timber and plant apple trees without attempting to clear up any more than cutting the timber down, keeping the sprouts down and plant the trees and follow Mr. Vergon's course as any other. It would depend upon the kind of site I had. I believe, however, that in most cases it is safer to follow the plan of cultivation. In most cases we have to take land that has been tilled for a greater or less length of time. In that case we must prepare first by thorough drainage if we haven't natural drainage. One good plan is to put a row of tile between each row of trees, having as many

Digitized by Google

rows of tile as of trees. Sometimes it is enough to have half as many rows of tile as trees. Surface drainage is not as good as tile. The reason surface drainage is objectionable is because the land washes, and because it does not aerate the soil in the same manner as the tile. Surface drainage is just a little better than nothing, but not very much. I don't think subsoiling is worth while in an orchard; it does not last long enough; the effect is only transient unless we can follow it up from year to year, and unless we do that I don't think it is worth while to go to so much expense in preparing the soil for an orchard. Tile draining I believe will do all that subsoiling can do and more. If I had land suitable for growing wheat or corn I would not think it necessary to prepare that land for an orchard to fertilize it in any way, and yet there might be a difference of opinion with regard to this and much would depend on the soil. If the soil needed fertility to grow the trees, of course it must be supplied. If you can not get barn manure, the next best thing is bone meal and muriate of potash. We ought to fit the land as thoroughly as we can with a plow and harrow. I need not say more on that topic, particularly. The selection of trees is an important matter and a very difficult one. In the first place we have got to depend largely on the nurseryman, not only upon his honesty, but his carefulness. The most of us have had experience in buying trees, and we know it is very hard to get trees true to the name, and I believe in a great many cases the nurserymen themselves don't know whether their trees are true to name or not. Of course I do not mean to cast any reflections on anybody, but it is a hard matter to keep trees true to the name in a nursery. With most varieties we can tell from their appearance whether they are true or not. However, after all we have got to depend very largely on the nurseryman. So far as honesty is concerned I believe that most of them are honest enough, knowing it is to their interest to have the trees named correctly, and I believe we can rely fairly well on a great many nurserymen. All we can do is to simply find out some nurseryman who we think is reasonably honest and trust the matter to him, and in case we find there is a mistake then we can resort to top grafting when the trees are young, or as some prefer they would take the trees regardless of the name or variety, simply getting some good hardy stock to graft on, and when the trees are one or two years old to top graft or bud them. This of course, has some merit, but whether it is the best for every individual or not depends on the man more than anything else. I shall not advocate it, and yet in my own work I shall practice it considerably. I would take apple trees two years old—you can not follow this rule strictly because varieties differ a good deal. I would take a tree five or six feet tall, and yet I wouldn't be too particular about the size. I would not

Digitized by Google

like to have a tree more than three years old and as a rule I would rather have it two years old than one, because the hired man doesn't have as much respect for the small tree as the large one. He is more apt to run over it in cultivating the ground or injure it in some way, because he is not so apt to see a small sprout as he would a larger tree. In preparing the tree for planting I would prune it severely both root and branch. I am not prepared to adopt Mr Stringfellow's plan altogether, but I do not believe he is altogether wrong. Long before I heard of his plan in in the nursery we found that we almost always had some stock we could not use and had to plant it out. Nurserymen do not do that very much any more because it is not so necessary as it used to be. The trees were worth more then and frequently we planted trees out in rows to save them. The roots were cut short as well as the top and we knew the trees could be grown by cutting off nearly all the top and almost all the root. I knew that long before I heard of his plan. Yet while I know that trees can be pruned in that manner, taking off all the side limbs and roots and not leaving them more than an inch or two long, I am not prepared to advocate that plan. We seldom get a tree from the nurseryman started as it should be. That is the orchardist's business. I would prefer cutting away all the side branches. We ought to do this carefully.

Mr. Garretson: How many limbs do you start out in forming the top?

Professor Green: I couldn't give any rule for that, but I would say, do not let any two limbs start out on opposite sides of the tree.

I shall not say very much about methods of planting. That seems to me too well known to need very much discussion. The distance between the trees is a matter of a good deal of importance. There are two plans we can pursue. We can plant the trees as far apart as we expect them to stand when they get to bearing or we can put trees between as fillers. There is a difference of opinion as to which plan is the better. I am sure I can't say. I have thought sometimes I would follow the plan of setting out fillers, but knowing my own weakness I don't know whether I should. I don't like to advise other people to do it. I am not so sure after all if you are going to cultivate all the land between, if you put your trees thirty-five or forty feet apart and you utilize the soil to the best advantage by growing crops between but what you can make as much money this way as to use fillers. If you want to use fillers you can do so, provided you take them out at the right time, and you can plant varieties like the Missouri Pippin, Rome Beauty, and Ben Davis or some of the earlier fruiting kinds,

Digitized by Google

and you can take out these trees when they are ten or fifteen years old and thus not do the permanent trees any harm. The chances are you will leave the fillers several years longer than you ought. I think every person ought to know how much back bone he has before he sets out fillers. The distance must be varied according to the soil. In southern Ohio you can plant apple trees safely twenty feet apart. You have to be governed according to the soil. It is safe to say that a good liberal distance according to the soil gives better results than crowding. I like to plant the trees a little nearer one way than the other because you will find when the trees get pretty good size you will have difficulty to get between them with a spray cart. It is very likely we will find means of spraying within a very few years wherein we will need more room than we do now. We find in orchards planted thirty-two feet apart there is not room to spray properly, and when we get larger machines for spraying I think we will find we will have to have more room. There should be a good liberal distance between trees according to the soil. The pruning of a young apple orchard is one that a person must study pretty carefully. I don't know how we can lay down any rules for it. I know, however, that a little neglect for the first two or three years may cause some trouble in the future. The first year after a tree is planted you must attend to the pruning with a great deal of care, not only in cutting off the surplus branches but to see that you get them located where they ought to be. You should go over your trees time and time again. You will find the time spent then is time saved in the future, and that is of very great benefit to the orchard to have the trees started right. It is a matter that can not be explained. You have just got to study it out and know what you are doing. You have got to look to the future, you have got to be able to see into the future of the tree, and you have got to have experience in order to know how to prune your trees. The amount of pruning that you have to do is not very large if it is followed up every year. You should not allow everybody to saw limbs from your trees. You can not lay down any rule for pruning all varieties of trees. Trees should be pruned with a view of getting into the trees to get the fruit and to do the spraying. Since spraying has become common, pruning is more important than it used to be, because you can not do spraying properly unless the trees are well pruned. We should not get into our heads the idea that pruning has some special virtue. The limbs are not cut off for the benefit of the tree particularly, but they are cut off for our own convenience. A few years ago an old gentleman who had considerable horticultural experience came to me and said, "I would like to prune your young trees; I see they need it." I said, "Of course they do. If you understand the work well I would as soon let you do it as anyone;" and without giving him any instructions I let

Digitized by Google

him go to work. I came around in a short time, and he was doing a fine job. He had pruned off all the spurs along the limbs. I said, "That does look nice, but it won't be very long until nature gets to work and undoes all you have done." He said, "What do you mean?" I said, "Those limbs ought not be left bare that way; it is not natural nor right. Leave the little spurs on. All I want you to do is to start these trees right, and I don't want the little spurs trimmed off. It looks well, but it is doing harm." He had an idea that the more cutting he did the better it was for the tree. Spraying I believe is important in the young orchard. We have been growing our trees now for seven years, spraying some and leaving part of them unsprayed. We can not see any very marked improvement except in one thing, and that is, the trees sprayed look as though they have been washed with lye. The bodies are clean and smooth and the trees look healthier than the others, but the growth is no greater. However, this year when the trees began to bear, those that were sprayed bore better fruit than the others. I would not go to the extreme. I use the Bordeaux mixture and the arsenical mixture. It don't cost much to spray your trees, and you can do it quickly. As to fertilizing, we can not lay down any rule. One can not say whether trees should be fertilized or not, unless he knows all about the conditions. On land that has sufficient fertility to grow a good crop of wheat or corn I can not see the use of having fertilizers until the trees commence bearing. Fertilizers that you use should not be very rich in nitrogen. You had better have a god supply of phosphoric acid and potash than nitrogen. Every one must be governed according to the needs of the tree as he sees it, and he can very easily see when the trees need fertilizing. I believe it best to cultivate a young orchard from the time it is planted up to the time it is ten years old. Don't stop cultivation before ten years. It is just as well to grow crops between the trees as long as you can get any crops that are worth anything.

Professor Burrill: What kind of crops?

Professor Green: Corn or potatoes. These are about the only ones; but in case the land needs more vegetable fibre, then you will have to plant something to plow under. If the trees are in need of more nitrogen, then you should plant some leguminous crop. You can't lay down any rule. For four or five years you can just as well plant crops of corn and potatoes, and after that you can keep up the cultivation, but I would not advise leaving the land bare in the winter time. I would have some cover crop to protect the soil in the winter and plow it under in the spring, and don't neglect to

Digitized by Google

plow it under early. You can sow a crop of rye and let it get pretty near full-grown, and plow it under; but it is likely to do more harm than good, because it robs the soil of so much moisture.

Professor Van Deman: Do you use vetch?

Professor Green: We do not succeed very well with vetch.

Mr. Garretson: Would a crop of late potatoes go well?

Professor Green: Yes, you can do that.

Mrs. Stevens: What would you do with potatoes in a hundred-acre orchard?

Professor Green: You would have to raise 100 acres of potatoes. I think corn is a better growth for the first year than potatoes. Really there is not a very great variety of crops that you can raise in an orchard, and the fact is we can not get profitable crops very long. After that you have to simply grow a cover crop and plow it under in the spring. The cover crop must be chosen as to whether you want to supply fertility or whether you simply wish to keep your soil covered during the winter and plow it under for the purpose of having vegetable fibre to the soil. You will have to be governed by that according to the kind of land you have. Unless you have made a good foundation for an orchard you can not expect to have any success from the tenth year on. So much depends upon the first years of the orchard that one ought to study it thoroughly in all aspects before undertaking to plant an orchard. You will notice I have said nothing about varieties. I might say something about varieties adapted to Ohio, but I can not say as to Indiana.

Mr. Johnson: What do you think about plowing in a young orchard planted four or five years, and in getting close to the trees?

Professor Green: In plowing young orchards for the first four or five years I would rather use a disk harrow than a plow. We use a spring-tooth harrow in connection with a disk harrow a good deal. You can not plow the ground with a common turning plow to any advantage unless you plow toward the tree on one side and from it on the other, and the next year reverse that order.

Digitized by Google

Dr. Collins: You were speaking of pruning an orchard for convenience; don't you prune it also for the size of the fruit?

Professor Green: Yes, it has an effect also on the color. I want to emphasize the point that the mere fact of pruning does not add to the longevity of the tree.

THE APPLE ORCHARD FROM TEN TO FIFTY YEARS.

BY J. A. BURTON, ORLEANS, IND.

I am pleased to receive an orchard that has been in such able hands during its first ten years. I trust I shall not lower its standard, or give the just critic occasion to remark what it might have been had Professor Green continued in charge. I shall expect to find everything as it should be; trees standing straight or leaning a little to southwest, headed at proper height for each variety, trained with a leader and all branches tending outward, an open head to admit sunlight and facilitate spraying, and bearing spurs down each limb to body of tree; ground left level and preferably in clover; trees of good varieties. If, however, the trees have not been trained just after my style, I would not attempt an abrupt change. Very few trees in my "now" orchard are just what I would have them. A flaring head I would open up and grow bearing spurs on remaining limbs. If unprofitable varieties have been planted, would top work or dig out. Can't afford to waste time with useless trees. Would keep heads well in control; that is, would not let them spread so wide as to interfere with their neighbors nor grow so tall as to be difficult to spray or gather the fruit. Would trim carefully each year, keeping heads open. Would spurn all statements that a man should be able to carry at one load all limbs that should be cut from a tree during its life. Would try to avoid cutting large limbs, but if I thought they needed cutting would cut them.

My cultivation will be entirely with the spade and smoothing harrows, unless it is to destroy some vicious weed or bluegrass sod. This is the most expeditious way to cultivate, and to my mind the most successful. I do not want clean cultivation in my orchard, but enough growth of clover, peas or weeds to prevent washing. This rubbish I want mixed up with the soil by the spade. Would cultivate both ways in April, May and June, working last cultivation with smoothing harrow. If land was rich as needed, would let it grow wild grasses and mow when getting too rank. If not rich enough would sow cow peas at last cultivation and hog down when ripe enough.

Digitized by Google

With a thoroughly good pump would spray when buds begin to swell. As soon as the wind changes, spray from the other side. I term this one good spraying. Spray again just before blooming, and from both sides within one week after blossoms drop. Would make the last two sprayings very thorough, as they are to determine the absence or presence of the codling moth; and that means whether I shall or shall not have apples.

Would thin severely. Never let a tree overbear. If a tree can support only five bushels, better that these five bushels consist of 700 rather than 1,200 apples. It is probable that a small apple will exhaust the tree as much as a large one. The selling price is very much in favor of the large apples. Thinning can be done much faster than is generally supposed. The longer an apple remains on the tree the better it will keep, and the better its color and quality. But they may fall badly near the ripening period, causing much loss. Therefore when they have colored properly would gather as soon as possible.

Then comes the job at which few have the courage to do their duty. Why should I hesitate to grade my apples as I please? I have the same amount whether they are in one pile or in four. Don't I know that a rotten apple will never be sound, and that a speckled one is likely to soon be rotten, and that a knotty one never can be any account if it does keep? Only sound apples can be expected to keep. Sound apples will sell for more if assorted into two or three grades. Would sell the speckled ones for whatever price I could get. Some people will buy anything that seems to be cheap. One man with a farm worth $20,000 has done without apples all winter because he could not learn when I had speckled ones to sell at 25 cents. Another that gathered for me at $1 per day took one barrel fancies and two No. 1's. What kind of apples or butter one will buy depends on taste, not wealth.

Would sell my apples as soon as I could find a fair market. Generally the loss from shrinkage and decay is greater than the advance in price. My best market is the home market. Next the small towns, and the final dumping place, even though I may get no returns, is the city.

Professor Taft of Michigan: It seems to me that the essays this morning are pretty hard to follow because they cover the subjects pretty thoroughly. I agree with the papers regarding the cover crops. We have used in Michigan for a number of years another crop which in some cases seems better than any of those mentioned. With reference to the rye and clover, they frequently trouble us in drying out the ground in the spring, and make plowing practically impossible on heavy soils. We use the common

Digitized by Google

oat. I don't know how the oat would thrive with your soils, but we can break the land after the first of August or the middle of August if we wish, and then seed it with this crop and get a good growth in the fall. It is a good cover crop, and in the spring it makes a good mulch. Of course the oat does not supply nitrogen, but as a cover crop and mulch it seems to be one of the best crops we have.

Mr. Kingsbury: When do you sow it?

Professor Taft: We prefer to wait until about the first or middle of August. We can sow the oat in Michigan until the middle of September and get a good crop.

Mr. Kingsbury: Would that be possible in our climate, could we grow oats sowed at that time?

Mr. Jesse Stevens: I have listened very carefully to these two papers this morning; for forty years I have been a student of what we have heard discussed here this morning, and I am frank to say to you that I have got to be a confirmed infidel. My friend Burton talks about education to raise apples. He can't raise corn. I can raise in my orchard corn enough to buy his place and have surplus left. I spent thirty-five years of my life trying to raise an orchard. I have spent hundreds of dollars where some of my neighbors have spent dimes, and I have never succeeded in raising a decent apple, and I challenge any man in the State of Indiana to do it. You can bring a spraying factory on the ground if you want to. I can raise brush, and I don't have to manure it either. We heard something about a list of awards at the Paris Exposition. I know every man named in that list. I have visited their orchards myself. I know the finest apples I ever saw in my life came from orchards owned by men too poor to raise a disturbance. I know that those apples which were produced there and which have attracted the attention of the world and have advertised Indiana, were raised on soil that has never been cultivated. I saw this fall specimens of Vandevere and Yellow Bellflower growing on trees fifty or seventy-five years old. I have come to the conclusion that there are places in Indiana adapted to the growth of apples, and there is where we should grow apples, but to take my

Digitized by Google

farm and set it out in apple-trees, I will guarantee you that you will go into bankruptcy. Every one of those names represented in that Paris award are names of men who have land adapted to apple growing. I have seen some apples growing there as seedlings in the fence corners which would do to exhibit at the State Fair. We must select the business our soil is adapted to. Some of us should raise hogs and some corn and some apples.

Mr. Tilson: We find almost everybody good for something. I am satisfied that an orchard ought not to have anything growing on it, a young orchard, up to August. Any crop you put there will take the moisture from the ground and from the trees. The ground should be broken up in the spring and thoroughly dragged. If you want to put anything in it in August, that will be all right. I am surprised that they will sow oats in Michigan in August. I believe that in sowing corn or potatoes it won't pay you for the moisture you take out of the ground. I am an advocate of the dust mulch. It will hold the moisture in the ground.

Professor Van Deman: I was very much interested in the statement of Professor Green regarding that orchard in Delaware, Ohio, the one which has been grown from the start without any plowing or cultivation, and nothing used except mulching. Nature mulches every tree she plants. There is not a forest in the world from the arctics to the tropics but what is grown on the mulching plan. When we plant apple orchards or any other sort of orchards, mulching in a measure becomes impracticable because we can not get the mulch cheap enough. I thoroughly believe that if an orchard could be well mulched from the start, and never cultivated, it would be all right, but as Professor Green has said, when you commence to mulch you have got to keep it up because the roots of the trees are near the surface and just underneath the mulch. If you would plow in there among those roots you would tear them all to pieces and ruin the orchard. I do not think the mulching plan is practicable. The cheapest thing to do it seems to me from my own experience and observation in many States, including Indiana, is to follow the system of thorough tillage and force the roots to live in a substratum instead of on top of the earth. The drier we can make the top soil the more moisture will be in the other. The more dust on top, the less inclination the root

Digitized by Google

will have to go upward and the more to go downward. We know that to be true in the cultivation of all kinds of fruit and farm crops as well. So it seems to me we can not reasonably accept any other theory of orchard culture as being practical in a general way aside from that which includes thorough tillage. The matter of tillage is one which is occupying more and more attention by the fruit culturists of the country, the orchardists particularly, and in peach culture also. Of course the subject under discussion is apple culture. This method of unceasing culture, beginning early in the spring and stirring the ground with implements is the plan of Mr. Morrill. I have seen in his orchard the weeder used to great advantage. He has a light sandy soil and it is different from the soil of Indiana, and that cultivation with the weeder was so cheaply done that it scarcely cost more than five cents per acre. I talked with one man who ran that weeder. He said that if rains didn't interfere he could cultivate seventy-five acres of peach orchard twice a week once each way. If we would double the cost and make it ten cents per acre, even that would not be a very expensive orchard culture, and Mr. Morrill's results speak for themselves. He took in over $35,000 from his peach crop of fifty acres in 1899. Of course that was an exceptional year because it was a very scarce peach crop. His neighbors said that he would bankrupt himself cultivating that orchard, but in that severe winter two years ago his trees went through it in a good condition, while many of the trees belonging to his neighbors were killed root and branch, some down to the big limbs and others not quite so much, and nearly all of them had their fruit buds killed. Mr. Morrill had a good crop of fruit. The orchards in southern Missouri are taken care of, and instead of beginning with the plow they begin with a Morgan spading harrow. That is one of the best tools I have ever tried. It digs up the ground thoroughly, but it makes the horses pull. You can not do any sort of work in the ground without making labor for the horses. Whenever you talk about a plow running easy you are not doing much good. Give me a plow that runs hard and I will show you soil that is pretty well stirred. Mr. J. C. Evans has told me how to do it repeatedly. The Morgan spading harrow is one of the cheapest implements. They begin with that in the spring and they go alternately in two directions until they have gone over that ground five times, and that is five

Digitized by Google

cultivations. Those five cultivations cost exactly the same as one plowing, and I leave it to any reasonable man in this audience if those five cultivations are not worth more to an orchard spread over a number of weeks than once plowing. Then just before the last cultivation, which is along about the middle of July and sometimes the last of July, and even as late as the first of August they sow cow peas. They let them lay until fall, and then they turn in the hogs and let them harvest the crop. They fatten a good many carloads of hogs with these cow peas. Thus their orchards are kept practically in good condition. In reference to fertilizers we want to avoid the use of chemical fertilizers as much as possible, because they are too expensive. Sometimes, however, it pays to expend a little money in order to get more out of our soil. When a tree is not making its growth that means nitrogen. A foot of annual growth should be found on every healthy apple tree. Phosphoric acid and potash are orchard manures more particularly than nitrogen. You can overdo the nitrogen business. I have known that to be done, particularly with the peach. If you are going to put in chemical manures there is none better than muriate of potash and dissolved bone. I prefer the dissolved bone to bone-meal. The dissolved bone is treated with muriatic acid. Another commercial fertilizer is called phosphate rock. Some people don't know what it is. These phosphate rocks are simply the fossil remains of prehistoric animals that have by some means become deposited in beds. They have become mixed with other manurial elements and have formed a sort of rock. When we use this we are using the bones of animals that lived a long, long while ago, instead of the bones of animals that walk the earth to-day.

Mrs. Stevens: In southern Indiana we use orchard grass. It forms a mulch. Our trees are doing splendidly. I would like to know if we are making a mistake in this. We have time to change it if we are, but we hope we are on the right track.

Mr. Kingsbury: With reference to the orchard of Mr. Newby I want to say that I have been in that orchard, and if I am any judge of a good soil I would say that his orchard is planted on first-rate soil. The grass is growing between the trees. He leaves his orchard uncultivated. The grass is blue grass and it grows very rank and tall. He says the grass is a good thing for the trees. He

Digitized by Google

mulches in this way and keeps the ground moist and in excellent condition, and has probably the finest apple orchard in the State. He has the greatest variety, and a very fine quality of apples.

The President: In explanation of Mrs. Stevens's remarks it is well to bear in mind that the orchard she is referring to is planted on very rolling land, and constant cultivation is impracticable. Mr. Burton grows clover in his orchard. His land is quite rolling.

Professor Van Deman: There is one thing I forgot. In the State of New York, Mr. J. S. Woodward, at Lockport, is one of the best orchardists in the State. He believes in keeping the orchard in grass and using sheep. He says he does things that will be very dangerous for anybody else to try. He feeds the sheep grain and bran and other things, and he puts into the orchard manure instead of taking something from the orchard and putting it into the sheep.

Professor Burrill: I do not own a foot of soil in which commercial orchards are planted. If there is any one speech that I should like to have framed this morning it would be Mr. Stevens's over here, provided I believed it. I have heard that story before, but I never heard it so well told. I believe it is entirely possible to put enthusiasm into this Society and into the fruit-growers of Indiana until this room will not contain your Society, and so that the State will hardly contain the enthusiasm of the people living in it. I don't think we are any smarter in Illinois than you are in Indiana, but I know some who have done better than $50 an acre on an average year in and year out for the past five years, and those years have not been especially good apple years. Yet there have been a lot of folks that have not done anything at all. I have this year been through our best apple-growing regions of Illinois, and there isn't one-twentieth part of those orchards that have been taken care of. There is only one here and there. We have gotten far enough along to know that if we are going to get a crop we must pay attention to that crop. And we know that the same thing is true of the orchard as well as the cornfield. I believe that these hills of Indiana and the flat stretches of prairie between are yet to become celebrated as the land of the big red apple. I would

Digitized by Google

like to ask Mr. Burton how much of a glut there is of the market for Grimes' Golden apples.

Mr. Burton: They don't go to the cities. They are gobbled up right at home.

Professor Burrill: There will be a great demand for those apples, and the city people will send out agents after your fruit from all sides. I don't believe there is any fear of overstocking the market with the best kinds of fruit. We are also learning how to take care of fruit. It should be kept cheaply and be available any day in the year. We are not altogether missionaries in this matter, but I can not help but think it is good missionary work to raise orchards and good fruit.

Thereupon the Society adjourned at 12 o'clock noon.

PRUNING AND THINNING A BEARING ORCHARD.

BY W. B. FLICK, LAWRENCE, IND.

Although having had the care of an orchard from its infancy to nearly a third of a century's growth, I feel that I can give no specific directions for pruning a bearing orchard except to cut out the dead wood and cut off water sprouts. The variations of climate, of growth, of the purpose in view, and other circumstances and conditions, render the treatment required so varied that the best results can only be secured by personal attention. Principles there are, truly, but it requires natural adaptability, close observation and an extended experience to apply them correctly. The prevalent idea that any one who can use a saw or an ax, is competent to trim trees, is erroneous and disastrous—causing, every year, the loss of many fine trees and orchards.

The novice or pretender should never be permitted to enter upon this important work without a competent guide or overseer. Yet we see so-called professional trimmers going about our beautiful cities and through our orchards mercilessly hacking and mangling these noble objects of many years' care, themselves and their employers, apparently, valuing their services only by the amount of mangling done and the magnitude of the brush carted away. Trees which have been objects of praise and admiration for years are by these butchers rendered unsightly remains of a vigorous and beautiful treehood. I believe that more trees and orchards are destroyed by this misguided cutting than by all other

Digitized by Google

causes combined. Owners of trees and orchards, or those who have their care, should be very cautious when employing any one to do this work, and should be fully satisfied that the applicant understands his business. Otherwise the results of years of work and attention will be lost through misdirected effort.

The competent trimmer will not enter upon his work with hand eager to cut and slash, but with due gravity and reluctance. He will feel that he is not working on dead material, that can be easily replaced when destroyed, but upon living material which when once destroyed can never be restored. The mother tenderly and reluctantly clips the golden tresses from her favorite child. So would I trim these objects of beauty and utility that have been reared under my watchful care.

But some say that is not practical; it is sentiment. We are after practical results, and need practical directions. Now, I would not undervalue the practical side of horticulture, but is there not already too much stress laid on the utility side, not only of horticulture, but of most other avenues of human endeavor? The paramount issue seems to be "money getting." The supreme question is, "does it pay financially?" The present age seems to be one of trade and profit only, and is not making true men and women, but a race of money getters. All the nobler and finer qualities of true manhood seem to be lost sight of. We need to demand a halt. He who follows any avocation only for the money that is in it works in a low plane, to say the least, and will not wholly succeed. He loses the highest purpose of all human effort which is found on the esthetic side. He who works conjointly with nature and enjoys her modes in all their variations—who reads divine law of the true, the beautiful and the good, written upon her work, is himself imbued with all the finer sense of nature and nature's God, thereby fulfilling nature's destiny. But we will now endeavor to stick to the practical side of our subject for the sake, if not the benefit, of our practical friend.

We trim to obtain healthy trees, for fruit and for beauty.

If the nurseryman and orchardist have given proper attention to the securing of these points previous to the time of bearing, but very little cutting or removal of wood will be necessary. The nurseryman should see that no unnecessary growths are remaining on the tree when sold—that the top is symmetrical, well balanced and not crowded. When setting out the tree, the branches should be shortened in to correspond with the loss of the roots in digging. Trees which have an upright growth should be cut so that the terminal bud shall be on the outside or farthest from the trunk of the tree—those which have a spreading growth, the opposite.

Digitized by Google

The after treatment should be confined to removal of dead wood and the rubbing off of unnecessary or undesired growths. More than this is for the most part injurious. The prevailing habit of cutting off all the side branches from the trunk for four or five feet from the ground is a butchering process, and contrary to the laws of nature and common sense. This exposes the trunk and larger branches to the seething suns of summer and the piercing winds of winter, thereby causing sun scald, bark burst, and many other injuries. Observe how nature works in building a tree—she always sends outside branches from near the ground up, and if it stands alone, or by itself, the side branches are all retained, to protect its trunk and large branches from the elements. If it stands in a grove, among its fellows, it has no need of side branches, and they are dropped. This illustration suits my idea of trimming. I believe in low down wagons and low down trees for nearly the same purpose. The low down tree is a money maker, as well as a money saver and a tree saver. It is much easier to spray. The fruit is easily gathered. If the fruit falls from the branches, they are not much bruised. The winds do not cause so many windfalls. The ground is more shaded, thereby retaining moisture. More sunlight and air reach the fruit and leaves.

My orchard trees, mostly set twenty-seven years ago, are so low that one has to get down on hands and knees to pick up windfalls. They, except the tall growing trees, such as the White Pippin, are scarcely 20 feet high for the highest, with a spread of from 25 to 50 feet. I have been successful in growing annual crops of fine fruit and attribute my success largely to low down trees.

Thinning out the fruit on the trees is in its experimental state with me, as I have done very little of it. On two occasions I have found the work profitable on apples and pears. The most effectual thinner that works in my orchard is the summer windstorm, but that of the present year came too late to prove beneficial. I believe that thinning is profitable and intend to employ it some when conditions are favorable.

Mr. Johnson: Mr. Flick has spoken of the young tree and the starting and head of the tree, and I notice he uses a low tree. In my practice in starting a young orchard I have endeavored to leave a leader and probably start one or two whirls of branches. I would like to know whether I should cut the top of that leader out.

The President: How far is it to the next whirl of branches?

Mr. Johnson: Twelve to eighteen inches apart.

Digitized by Google

Mr. Henby: I should think if the leading branch of the tree is in proportion to the other branches, and the other branches are properly proportioned on the tree, it would hardly be necessary to cut the top. Otherwise I should certainly clip the leader proportionate to the balance of the tree. As Mr. Flick intimated, and as was intimated yesterday with regard to trimming shade trees or street trees, I think there have been thousands and thousands of trees ruined by too much trimming, and I think that proper judgment should be used in trimming an orchard. I think the saw and the ax should be dispensed with almost invariably. There are occasions in trimming an old orchard where it probably will be necessary to cut out old branches that have become diseased or decayed. Otherwise, if the saw and the axe are never used in the orchard it would be better. The tree should be equally balanced. That can be done with a hand pruner, and that is about the only tool that should be used on the orchard after it is once established. Now in our little city I have been very much chagrined at our people in trimming their street trees, and I have talked to them and reasoned with them and lectured them and advised them as to the proper manner of trimming their trees and the proper time, but it does not seem to do any good. I suppose that all horticulturists interested in trimming trees have had the same experience with the average farmer or the average school board or the average town board. However, it does very little good to advise, and I have almost got discouraged. They trim their trees in August or September or June or July, just whenever it comes to their minds to trim their trees, they trim them. They lop off large branches with the saw or the ax, and at that time of the year the sap is in full flow and the tree growing, and it is almost an impossibility to cut a large branch from the tree without loosening the bark, and that of course brings about decay. Now in trimming a young orchard I would trim it very early in the spring or late in the winter, and I would use a very small, sharp instrument, and I would take off such branches as show signs of decay or that have a tendency to unbalance the trees, and if that is done and kept up there will be no occasion for the use of the ax or saw in pruning.

The President: Mr. Van Deman, what form of top is best adapted for the Central West?

Digitized by Google

Professor Van Deman: My preference is to have a central stem if possible. I would have, according to my ideal, the branches coming out alternately on all sides, not all in one place or all in two places, but in just as many as I could get going round and round the tree. With most varieties two and a half feet is very good place to begin the heading. Of course the place for heading the tree depends, as has already been said, on the variety. Those varieties that are upright in growth should be headed lower than those that have a spreading, sprawling habit. But in this part of the United States I should say that the central heading is best. Of course I would not have it so dense that the sun couldn't shine through, or so dense that the light couldn't get in to color the fruit, because if you have it very dense the inside fruit will not be colored. I am very much opposed to this idea of trimming off all the little sprays on the main branch. I believe in leaving them the same as nature has them. That will produce the best tree and the best fruit, and there will be less danger of sun scald.

Mr. Flick: I will say in answer to Mr. Johnson's question that it depends somewhat on the nature and growth of the tree. I would not cut out the top or make a cup shape top with some varieties, especially with the willow twig. It branches rapidly and is easily split open or destroyed. I think the central stem system, with that and other varieties which might be named, would be preferable to any other system.

Mr. Little: It seems to me that some varieties of apple trees have a growth more upright, while others are more spreading, and I think the head should be started about where it ought to be. I believe a low head will nearly always bear earlier and bear more fruit than the higher head, and will remain healthier. After you have the head, and have it thinned out as it should be, then I think the tree should take its natural course. I think that is about as common sense doctrine as can be preached.

Mr. Thomas: Where a tree is allowed to form its head all in one place without a leader it is liable to form forks which are liable to split when the tree is full of fruit. For that reason I prefer the leader to be up far enough so there will be branches enough for the tree. Then if the leader is inclined to not be strong enough or

Digitized by Google

likely to run up too much, I would clip the leader and make the tree of a more open head.

Professor Van Deman: A great many people have old orchards with the limbs of the trees interlocking, or at least coming so close together that you can't get through them in order to spray and all that sort of thing. Now, instead of going into those trees with the ax and saw to trim off the larger limbs and give the few remaining ones on the tree more room, take the ax and deliberately cut down half of the orchard, and then take care of the other half. In many cases it is best to go through both ways and leave only one-fourth, and put the same labor on the one-fourth that you do on all of them, and give them room to develop sidewise, and have less of this little green-colored and worthless fruit. Give the trees room to assume natural positions, and that is far preferable to undertaking to trim them. When in New York two or three years ago, I saw one orchard which I am certain was twenty feet to the first limb.

Mr. Little: Did they have a lightning-rod on it?

Mr. Henby: They didn't need any. They were high enough to catch the clouds almost without any lightning-rod. They were in the forestry business and not in the fruit business.

Mr. Davis: Speaking of these trees being headed low, I would like to ask if the fruit in the center of these trees on these lower limbs would not be of a poor color. I have noticed that in some orchards not very far from us where trees were allowed to head low, and as Mr. Flick said, if you want an apple you would have to play hog and go on your hands and knees after it. Every apple on the lower limbs is not fit to eat or cook. What is the cause?

Mr. Flick: If the tree is properly trimmed so that the sunlight can come in, there will be no trouble. I have picked some of the most beautifully colored fruit that I have near the ground. In fact, I see no difference whatever in the color of the fruit near the ground, unless there is too much shade or the foliage too dense and thus prevents the circulation of the sunlight and air.

Mr. Little: If you will travel over the western country and observe, you will come to the conclusion that the people generally are

Digitized by Google

in favor of a low heavy tree. Most of our commercial orchards are low-headed, and I prefer them because they are more profitable.

Professor Green: The coloring of fruit is due to more than one cause. There is a fruit-grower in southern Ohio who always picks his Rome Beauties twice. He first picks the best colored ones and then he gives the other ones a chance to color. That shows that if you relieve the tree somewhat of the fruit the other fruit will develop. I doubt if the height or the top has much to do with it. I think the condition of the tree and the foliage has more to do with it.

Professor Burrill: I don't like to have the subject entirely passed without a word in reference to pruning. The most vital thing for us to learn is that orchards must be cultivated if they are going to succeed. The best implements for cultivating orchards are those described this morning, the extension spading harrow or cutaway disc harrow, or something of that kind is the thing to use. Whatever you use, you should go under the trees. Trees planted forty feet apart, in ten years the roots will be widely overlapped, and I am of the opinion that the entire surface of the orchard must be cultivated, and not cultivate simply as far as the top extends. I think the orchard is in better shape if it is low-headed, but sufficiently high to permit cultivation.

HARVESTING AND MARKETING.

BY J. C. GROSSMAN, OF WOLCOTTVILLE.

We are all ready to acknowledge the fact, especially after hearing the instructive papers of Professor Green and Messrs. Burton and Flick, that it akes careful, intelligent treatment to grow a crop of fruit. And I believe you will all be ready to say that it takes the same careful, intelligent work to properly harvest a crop after it is grown, and much more intelligent business tact to market the crop, at a profit, than it does to grow it.

The first requisite, then, is for the orchardist to supply himself with a sufficient number of strong, light ladders of several lengths and strong, well made step ladders of different sizes. These should all be of such construction as to be easily handled and not cause injury to the trees. I noticed a step ladder in use in Mr. Morrill's peach orchard last August

Digitized by Google

that struck me as having the qualities of strength, lightness, safety, and general utility combined in a greater degree than in any other that I had ever before seen or heard of.

In picking I prefer the common grain sack hung over the shoulder. This gives the picker the free use of both hands and also the fruit can be emptied with less liability to bruise than from baskets.

The fruit can be emptied in boxes, barrels, wagon bed or in piles in the orchard as best suits the facilities and convenience of the owner. It should be graded at once and the first and second grade packed and preferably put immediately into cold storage. The third and fourth grades and culls, if there be that many grades, should also immediately be disposed of respectively to the evaporator, cider mill and hog lot. The method of packing and style of package will depend largely upon the variety of apples and the market in which the grower expects to sell.

I believe that we are on the eve of a great revolution in the method of packing and marketing apples.

The orange growers of California were taught a severe lesson in packing by the Australians at the Chicago World's Fair, and they were not slow in profiting by it, either.

So, too, are the California fruit growers teaching us in the middle west and the east a lesson in grading and packing, which it seems to me we are rather slow in learning.

And the large commercial apple growers and exporters of the United States would do well to take the lesson that the Tasmanian apple shippers are giving them and profit by it, as they easily can, by their much better fruit, if properly graded and packed, and their much nearer markets. I am a firm believer in the wrapping and the packing of the apple in small packages. In fact, and I wish to strongly emphasize this point, if the apple grower of to-day and the future wishes to successfully and profitably cater to the demands of the best customers and markets, he must wrap his apples and firmly pack them in bushel boxes or in one-sixth bushel peach baskets, as his trade or market demands.

Now if I could be so successful an apple grower, that after grading out the strictly fancy fruit for exhibition at the Pan-American Exposition and have such fruit as Joe Burton's cull Winesaps and Grimes' Golden as he calls them, left, I should take those 'culls' and neatly wrap and pack them in bright new one-sixth bushel peach baskets and cater to the fancy retail market of the nearest large city, and I am satisfied it could be done at a profit, too.

Now in explanation, and so you do not misunderstand me, I should wrap and pack in the small baskets only choice high quality apples, such as Grimes, Jonathan, Winesap, Snow, etc., but never a Ben Davis in a

Digitized by Google

handle basket. But I believe there would be profit in wrapping strictly fancy Ben Davis, even, and packing in the bushel box for the export trade.

Many who are here to-day will remember the visit to the cold storage plant here a few years ago. We saw there Yellow Bellflowers from Oregon, packed in boxes, and I was impressed by that sight, that that would be the package for the future. I believe that impression will be verified in a few years.

DISCUSSION.

Mr. Burton: Uniformity is important. Mr. Grossman says he favors gathering the apples in a sack. I do not believe in that. After they have stood a few days there will be found bruised places which would not even make good cider, and after he has gathered them in this way then he insists on wrapping them in tissue and parchment paper. He must have got that from a very old magazine. My idea is that we must gather the apples carefully, as well as wrap them carefully. I believe they should be gathered in a basket, and not a very large basket either. They should be placed carefully in the basket. You should avoid picking apples in sacks. It makes me nervous when people come to my house and want to buy apples, and put them in a sack. One of my relatives came once and bought seven or eight bushels of cull apples, and put them in sacks. He asked what I would charge for the apples, and I said to him, "If you will never come with a sack any more I will give you these." Monday morning a man came to my house and wanted some cull apples, and he took them six or seven miles in two sacks. I just wondered in what kind of fix they would be in when he got home.

Professor Van Deman: I will say in defense of the sack business, that Judge Wellhouse has for many years been using sacks, and he has picked hundreds of thousands of bushels of apples.

Mr. Thomas: With reference to boxing apples, I am of the opinion that apples should be put on the market in small baskets, so that a man can take a basket on his arm and take it home with him.

Digitized by Google

Professor Van Deman: Within the last year we have had considerable said in the papers about using boxes for apples. A good many have been trying it. I think that the boxes cost one-half more than barrels.

The President: The box is the proper package for export.

Professor Green: I have used the box, and the first difficulty is in the packing. I can't make it come out right, and you can not pack apples in a box as fast as you can in barrels, but I am quite sure they will sell better, and I think you can get enough more for them to pay for the extra price of packing.

Mr. Grossman: Can you describe the boxes in dimensions.

Professor Green: I can't give you the exact dimensions, but they should hold about a bushel. Some say they should hold one-quarter of a barrel and other about a bushel.

Mr. Simpson: Mr. Aldrich of Illinois sold his apples this year to the Born Bros. of Chicago, and packed them in boxes eleven inches square and twenty-two inches long.

Professor Van Deman: That is the inside measurement?

Mr. Simpson: It was a solid box, and the side, or rather the top spread out.

Mr. Henry: Last summer I had a few very fine yellow apples. So I thought I would experiment and see what I could get out of them. So I took some little three-pound baskets which would hold nine apples apiece, and picked them in those baskets, and took them downtown and sold them at fifteen cents a basket. It would take about twenty-five of those baskets to make a bushel. They were selling apples then out of the store at sixty cents a bushel, and I thought I got paid pretty well for my fruit baskets.

The following report of the Committee on Awards was adopted:

Members of Indiana Horticultural Society:

Your awarding committee begs leave to report the awards on fruits and flowers made by them to wit:

C. P. Bradley was awarded premium on apples as follows: First on Hubbardson, R. I. Greening, Baldwin and Pewakee; second on Rome Beauty and Wagener.

Digitized by Google

H. H. Swain, second on pears.

S. Johnson, second on R. I. Greening and first on King.

Noble County Horticulture Society, first on Wagener and second on Mann.

Lagrange County Horticultural Society, second on Talman's Sweet and McAfee.

R. H. Newman, second on Smith Cider.

Mrs. W. B. Flick, first on carnations and cut flowers. (Amateur.)

Albertson & Hobbs, first on persimmons.

Southern Indiana on Smith Cider, Wine Sap and Grimes' Golden.

Joe A. Burton, first on Wine Sap, Ben Davis, Grimes' Golden, Genet and Kentucky Red Cider Crab.

S. T. S. Williams, first on N. W. Greening, York Imperial, and second on York Imperial.

W. B. Flick, second on persimmons, Rambo and Willow Twig, and first on Jonathan, Willow Twig and White Pippin.

Mrs. W. B. Flick, second on Genet and quinces.

Snead Thomas, first on Vicar and Duchess pears, Mann apple and quinces.

W. B. Flick, first on display of pears.

J. J. Milhouse, first on late pears.

J. Y. Demaree, first on Red Detroit, Porter, Twenty-ounce and Baily Sweet and second on Baldwin, Wealthy, Gravenstein and Falawater.

B. F. Cole, first on Bellflower, Romanite, Missouri Pippin, Maiden Blush, Rambo, Benoni, Gravenstein, Red Canada, Smith Cider, Falawater, Gilliflower and Rome Beauty, and second on Northern Spy and Rambo; first on pawpaw.

W. D. Thomas, first on Northern Spy, Roxbury Russet, and apples adapted to central Indiana; first and second on Ben Davis, Yellow Bellflower, Hubbardston, Grimes' Golden, Jonathan, Pewakee, Winesap and Maiden Blush.

J. R. Clore, first on Stark apple.

Fred. Dorner, first and second on carnations. (Professional.)

Your committee desires to report further that we found many exhibits misnamed, some named and not entered and some others not named at all

L. B. CUSTER,
S. JOHNSON,
W. C. REED,
Committee.

Digitized by Google

REPORT OF VICE-PRESIDENT OF SOUTHERN DISTRICT.

BY MRS. W. W. STEVENS.

This has been an unprofitable year for most tree fruit growers in the southern part of the State—in fact, we have not had a profitable crop of apples or peaches for three years. Some farmers along the Ohio River, where large orchards were planted a few years ago, and which were formerly very profitable, are becoming discouraged, and we hear of some that are cutting down their trees. The only real nice fruit of either apples, peaches or pears in Washington County the past season were found on the low lands, or in the ravines in orchards. We found but one profitable orchard in our neighborhood the past season, and that was on low, flat land, protected on the west and north by forest trees. The fruit industry on the average farm is decidedly on the decline. The business is fast going into the hands of the specialist. Old orchards are dying out and but few new ones are being set out to take their places. And it is well that the old plan of the farm orchard is being given up, for it don't pay. The average farmer should have a few trees, one or two of the leading and best varieties running from the earliest of the season to the latest. These he can find time to spray and properly care for, and they will be profitable for home use, and we might add, indispensable as well. With a small spraying outfit, any farmer can find time to go over a dozen or so trees just when they need it, so as to have an abundance of perfect fruit. How or why it was that the cherry crop was such a good one with us the past year we are not able to tell. It was the most abundant it had been for a number of years.

Small fruits were an average crop, and growers realized fair profits. The Snider blackberry is fast becoming a thing of the past. On account of its coarse seeds housewives will hardly have them as a gift, especially when they know of the newer and better kinds.

One of the fruit crops that is now attracting more attention than formerly is the persimmon, both the wild and cultivated. They are harvested from the first of August to January. In our own local market we seldom see an over-supply. Now that they can be canned and kept for use all through the winter, they are being sought after much more than formerly.

We observed that a great many of the small spraying outfits were sold in our county the past season, they being bought in most instances to experiment with, but as apples failed it could not be told how much good the spraying did.

Digitized by Google

The fruit trees went into winter quarters in most excellent shape, on account of there being no fruit the past season and late fall. We don't know that we ever saw the buds in better shape at this season of the year.

Twig blight did great damage to many apple trees the past season. It seems that this trouble is growing worse year by year.

The Keiffer pear is steadily gaining in favor in my district. For a few years now they have been our most profitable fruit, and are in good demand, both to eat out of hand and as a canner. Whether it is due to our soil, or that they are being better handled than formerly, we do not know, but the fact remains that wherever you once sell a bushel of well ripened Keiffers there is no trouble in holding a customer. The failure of other fruits has possibly made a demand for the Keiffer, but it is fully capable of holding its own.

DISCUSSION.

Mr. Swain: I want to add a word with regard to the Keiffer pear. I have had the same experience as Mrs. Stevens.

Mr. Little: I will say that a few years ago, as some of you will remember, I stood out against the State of Indiana and the world and advocated the Keiffer pear, and I still favor it. I got some grafts from Mr. Furness and top grafted a seedling tree, and the next year it was loaded down with pears. I loaded them in the cellar like potatoes, and they lay in the cellar until they got yellow. I did not expect they would ever be any account. They seemed to be tasteless. I was prejudiced against them. Along toward Christmas I took hold of one and it seemed to be soft, and I bit into it. I liked it and took it and introduced it to my folks, and they all liked it, and I filled my pockets and went down town and gave some of them to my friends, and they would smile, and once in a while I would meet an enemy and give him one, and he was always my friend afterward. So I concluded the Keiffer pear was a good thing after all. I don't know of anybody now who is not in favor of the Keiffer pear. This pear has always been a kind of mystery to me. It depends on treatment altogether as to whether it is one of the best or one of the meanest things in the world. If treated right it is a good thing. And my observation is that the Keiffer pear must be smothered when ripening. My plan is not to gather my Keiffers until just as late as possible. I didn't gather them this year until after the election. Now I can show you as nice Keiffer pears as you ever saw. I sold my ten bushels yesterday in Danville.

Digitized by Google

In measuring my ten bushels I found about one pear to the bushel that was specked. The Keiffer pear should be ripened in the dark and it should be smothered. You don't want the light on it. If it is ripened in the dark it will ripen through and through. I can not think of anything that has been introduced in my day that is as good and valuable as the Keiffer pear. I don't believe any pear on earth can stand against it on the market. We don't have any use for apples in our house, although we have good apples in the cellar. We use the Keiffers.

Mr. Johnson of Marion County: I want to say a word with regard to the Keiffer pear. At first I said some very hard things about it before the Society, but I have taken it all back. Now I want to say that I endorse everything that my brother has said. I could not do without them. I would not think of doing without them if I had pears at all. This pear is entirely different from what I first thought it was. When you can pears in the fall or this time of year and when you open them in the summer or next spring you can not tell this pear from the Bartlett.

Mr. Fletcher: I want to say a word with reference to persimmons. At one time I was in the country where nothing but persimmons grew. They did not have to be cultivated. I was anxious to know what could be done with such a fruit if it were cultivated. I planted some seeds, and the result was that I had as large a variety as I had of seeds. I had more interest and pleasure in bringing forth that fruit than anything else. This climate is well adapted to persimmons. There is in this town a tree planted by Bishop Ames fifty years ago. It is eighteen inches in diameter and has fruit on it to-day. It has one or two seeds to the persimmon. Because persimmons will pucker one's mouth there is no reason that it should not be better than most any fruit when ripe. Give the persimmon a chance.

Mr. Kingsbury: In regard to the Keiffer pear I class it for my eating with the Ben Davis apple, and I like it about as well as I like Mr. Johnson's friend, the English sparrow. My family has no desire for the fruit. We can not get it in condition wherein we like it, but I think enough of it to offer it to those who have no other fruit. I superintend a little Sunday-school in the Guardian's Home

Digitized by Google

at Irvington, and I one day asked the matron if she thought the inmates would like some pears; that I had some pretty nice eating pears, but they are not good enough for my family, and if you say so I will send them out and you can see if the children like them. She said, "Bring them along; they will eat most anything." I took over a bushel, and I never heard of any ill results from eating the pears, and they got away with them. That is about the only disposition I have been able to make of my Keiffer pears.

Professor Van Deman: It may not be known to the public at large that all the canners who are canning Keiffer pears are, with one exception, in the United States, as far as we have found out. With one exception they are all labeling the cans "Bartlett." Whether or not that is a fraud, of course, remains to be proven, but it seems to me that the Keiffer should be labeled in its own name. I think myself it is not equal to the Bartlett in flavor when canned. I think the Bartlett is the better of the two, but still a well canned Keiffer in proper condition is a very good thing, and there is no denying of the fact that the Keiffer pear to-day is the business pear of America, just as the Ben Davis apple is the business apple of America, and I am glad to see that the country is being filled with the Keiffer pear and that our people who carry the dinner pail and work by the day will be able to have Keiffer pears in abundance after a little while. As to the persimmon, let me drop one suggestion: Indiana, especially the southern part of the State, is an excellent place to grow persimmons. There is no doubt but that there is a great future in the raising of persimmons if properly treated, if the same effort is made to improve the varieties of the persimmon as there is the varieties of the apple or any other kind of fruit, and I want to urgently suggest to those who are in position to do so, that they try to cross the native persimmon and the Japanese. The Japanese varieties should be protected with hay or straw and control the temperature. If the native varieties are cross pollenized with the Japanese, that will produce a generation of seedlings which undoubtedly will be of great value to the country. This is worthy of the closest attention of the very best experimenters. One of the best varieties of the Japanese persimmon is the Yedoichi. It comes from the island of Yeddo, which is in the northern part of Japan. It is one of the hardiest and very richest in flavor. I

Digitized by Google

am sorry to say it is quite seedy. The flesh is dark colored inside, and the size is about the size of an ordinary Wine Sap apple. Zengi is another very good quality, and is also one of the hardiest, and it is dark fleshed and seedy. Another very good one is Tanenashi. This is a seedless one and is not quite so hardy as the two I have just mentioned. You should protect them just the same as you would fig trees or you should put them in fruit houses where you can protect them thoroughly. Cross with the native species and I think you will see in twenty or fifty years from now these crossed varieties all over the country, just as hardy as any of our native varieties, and with fruit two or three times the size and fully as good or even better quality than any we have, though I like the quality of our native persimmon.

Mr. Phelps: The storm which destroyed Galveston blew off sixty-five bushels of pears, and I put them in a crib in a dark place and threw a blanket over them, and in about two or three weeks from that time they became mellow, although they were not much more than half grown.

Mr. Clore: There is one very important point which I have not noticed being touched on, and that is the handling of the pear from the time it is pulled off the tree until it is marketed. I have often heard the remark that you can handle the Keiffer pear like rocks, but I find in my experience that is a great mistake. Any fruit should be handled as carefully as eggs, and it don't make any difference how hard the pear is when you take it off of the tree, it takes only a very light knock or jolt to cause the pear, as it begins to mellow, to have a black speck on it, and that will spoil the sale of the pear. Last fall I hauled Keiffer pears twelve miles to market and sold them readily at one dollar a bushel, while grocerymen had pears going to waste on their hands at sixty cents a bushel. That was simply because their pears had been handled roughly, poured out of baskets into barrels and tubs, any way to get them off their hands, and they were a hard looking sight. When you drive up to a house with nice yellow pears, I tell you they will buy them.

Mr. Little: I would like to ask a question with reference to the fungus or russet appearance of the Keiffer pear. Has spraying been effective in this respect?

Digitized by Google

Mr. Simpson: It has.

Mr. Little: I don't know of any Keiffer pears in Hendricks County for sale now excepting what I now have. I suppose I have thirty bushels of them. I have gathered between fifty and one hundred bushels since the election. The longer you leave these pears on the tree the longer they will keep, provided of course, they are not frozen. A little freeze won't hurt them. Put the pears in the barn and bed them down with straw and put blankets over them. I let them get cold. Just so they don't freeze, the cold will not hurt them. I let them get just as cold as they can get without freezing, and I cover them with clover hay. I think the clover is a nonconductor. This is a cold storage of my own.

REPORT OF VICE-PRESIDENT NORTHERN DISTRICT.

BY J. C GR SSMAN, WOLCOTTVILLE, IND.

To the Officers and Members of the Indiana Horticultural Society:

I respectfully submit the following report for your consideration:

Upon assuming the duties of the vice-presidency of the Northern District, we felt that one of our first duties to perform was to increase the membership list, if possible; as that, at the present time, is the only source of revenue of the Society.

This we succeeded in doing in LaGrange and Noble counties, where we could look after the work personally, while in other portions of the district, which we could reach only by correspondence, there was both loss and gain.

In order that you may understand fully the location of the membership in this district and where the loss and gain occurred, I give the list by counties for both the years 1899 and 1900, which is as follows:

County.	1900.	1899.	*Gain.*	*Loss.*
Adams	..	..	..	..
Allen	3	2	1	..
Dekalb	6	3	3	..
Elkhart	1	3	..	2
Fulton	1	3	..	2
Huntington	3	1	2	..
Jasper	2	2	..	..
Kosciusko	1	..	1	..
Lagrange	20	6	14	..
Lake	..	2	..	2
Laporte	1	1	..	..
Marshall	..	3	..	3

Digitized by Google

County.	1900.	1899.	*Gain.*	*Loss.*
Miami	4	1	3	..
Newton	1	1	..	..
Noble	32	17	15	..
Porter	..	..	..	..
Pulaski	2	2	..	..
Starke	..	..	..	..
Steuben	4	1	3	..
St. Joseph	13	26	..	13
Wabash	1	2	..	1
Wells	..	1	..	1
White	..	..	..	..
Whitley	..	..	..	..
Total	95	77	42	24

Giving a net gain of 18 over the previous year.

The loss I think is the result of simple neglect to send in their annual fee on the part of some who are not in the habit of attending the meetings, and thus do not get personally reminded of the fee being due.

The gain you see is largely where we were enabled to give our personal attention to the work. Now, it is practically impossible for a vice-president to see all the members of his district to remind them that their fees are due, or to solicit new members in each county of his district personally. Now, if by personal work the membership in two counties can be increased 29, why can not each member who attends this meeting go home and do a little personal work among his friends and neighbors? If they would do so the membership could easily be doubled.

St. Joseph, Noble and Lagrange counties each have active and prosperous local societies.

We understand Allen County organized a local society the fore part of the year, but we have been unable to secure any data in regard to it. So far as we can learn these are the only local societies in the district.

The St. Joseph and Noble county societies each made exhibits at the last State Fair, St. Joseph County carrying off the sweepstakes and Noble County the fourth prize for the best county exhibit.

There were also a number of individual exhibitors who carried off a fair share of the premiums in other classes. And there will be more in the future.

The soil of this district is so diversified that all the known fruits that can be grown in this climate are produced in some locality of the district. Yet there are as yet no very large tracts of orchards, but numerous small ones in favored locations.

But there are yet many favored localities, principally bordering on the small lakes, especially adapted to peach and apple culture, that are yet practically undeveloped.

Digitized by Google

We are happy to say though that the plantings of these two standard and indispensable fruits are on the increase, and we predict that ten years hence there will be a wonderful increase in the fruit product of this district.

The noted lake region and fishing grounds of Indiana lie wholly within this distrct, and there is scarcely a lake, no difference how small or remote from railroad facilities but what has its campers and cottagers during the summer season. There is an ever increasing population to these quiet rustic resorts, from the cities of Chicago, St. Louis, Indianapolis, Richmond, Muncie, Ft. Wayne, Dayton, Cincinnati, Columbus, and smaller cities and towns within and bordering upon this district. Where the summer population a few years ago could be numbered by the hundreds it is now numbered by the thousands.

Some no doubt are wondering what this has to do with the horticultural report of a district vice-president. It is this: that instead of having to send the bulk of our summer fruits to the city market, the city customers come to our very doors, we might say, and demand the best fruits that can be produced, and gladly pay the top price for a choice article, thus making a satisfactory market for the horticulturist, for all kinds of produce, and what is more and better, a profitable one. Many wide-awake horticulturists of this district, who are so fortunate as to be located near these resorts, have not been slow to take advantage of these opportunities. This will be, in the future, one of the greatest factors in the development of the fruit industry in the Northern District.

In this district also are found a great many of the finest and most extensive marl beds in America. The prospect of the extensive development of these in the near future will be another important factor in the development of the fruit industry.

The season of 1900 was a favorable one in most respects for the fruit grower. While the crops of some fruits were below the average, the crop of the majority was a fair average, and the prices in most cases ruled better than for several years past.

About July we received the following communication from the Secretary of the Oregon State Board of Horticulture:

Portland, Ore., June 28, 1900.

"Mr. J. C. Grossman, Vice-President Fourth District Indiana State Board of Horticulture, Wolcottville, Ind.:

"Dear Sir—We beg to report to you, for the benefit of your horticulturists and dealers, that at this time the fruit crop of Oregon is about as follows, the percentage being based on a full crop, viz.:

Digitized by Google

	Southern Oregon.	*Western Oregon.*	*Eastern Oregon.*
Apples	80	90	100
Pears	20	80	95
Prunes, French	50	100	...
Prunes, Italian	10	30	100
Cherries	..	65	90
Grapes	..	65	...
Peaches	10	...	95

"We would thank you for information of the condition and present prospects of the fruit crop in your locality.

"The writer takes pleasure in handing you herewith our lastest Spray Bulletin.

Very truly yours,

HENRY E. DOSCH, Secretary."

And also later we received a like request from James Handly, Quincy, Ill., Secretary of the Mississippi Valley Apple Growers' Association. In order that we might intelligently comply with these requests, and believing that the same information would be of interest to our own Society, we sent requests for the desired information to horticulturists in each county in the district, and received prompt and complete reports from twenty-one of the twenty-four counties.

We wish at this time and place to thank all those who so kindly and promptly complied with our request. And we also wish to incorporate these replies, as a part of this report, in the published proceedings of this Society.

These reports we tabulated and furnished the Secretary of this Society with a copy of the same at the summer meeting, held at Plainfield, August 16-17, 1900.

In this report we can only refer to the average per cent. for the district, which is as follows: Apples 58 per cent., pears 66 per cent., plums 58 per cent., peaches 34 per cent., cherries 53 per cent., quinces 42⅓ per cent., grapes 84½ per cent., strawberries 83⅓ per cent., raspberries 82¼ per cent., blackberries 76½ per cent., gooseberries 75½ per cent., currants 81½ per cent., and huckleberries 55 per cent. By the above figures you will see that orchard fruits were below an average crop, while bush and small fruits were above the average.

But what promised to be a fair crop of apples was changed in a day by the "tail end" of that great and terrible "Galveston storm." In many places there was not 10 per cent. of the crop left upon the trees. Thousands of barrels of what otherwise would have been good fruit had to go to the cider mill and the evaporator as a consequence of that storm.

We expected to secure a good exhibit of fruit for the Pan-American Exposition, but the sad havoc that the above storm played with the fruit

Digitized by Google

made it hard and tedious work to find suitable fruit. We, however, received promises from a number of apple growers in the district that they would contribute, but how many barrels have been forwarded we do not know.

We made the attempt to collect a barrel from the farmers of Lagrange County, and after a week's hard work, and consequent neglect of our own business, we succeeded in getting three-fourths of a barrel of fair fruit.

Trusting that the facts and thoughts given herein will meet with your approval, and that they will be of some practical benefit to the Society and of interest to the individual members, we conlude our report trusting and firmly believing that the coming century will see greater progress in the science of horticulture and in the development of both new and native fruits, and that prominent among these will be the persimmon and the "Hoosier banana," the pawpaw.

ANNUAL REPORT OF THE NORTH CENTRAL DISTRICT OF THE INDIANA HORTICULTURAL SOCIETY.

BY AMOS GARRETSON, VICE-PRESIDENT, PENDLETON, IND.

I can not say that the past season has been noted for its extremes—cold, hot, wet, or dry—but it seems we have some failures of some crops in one locality and of other crops in another locality. Apples have the lowest average per cent. of any fruit in this district the past year, 29⅔.

In several counties the per cent. was as low as 10. In our neighborhood there was almost an entire failure. The trees bloomed well, apples set on fairly well, then the trouble set in. What was it? Curculio, fungi, lack of vitality, or something else. When I drove into my orchard to give it the fourth spraying, I found the trees almost fruitless. It could hardly be for want of spraying, as I sprayed four times, twice before the bud opened with sulphate of copper 6 pounds, lime 6 pounds, water 50 gallons; and twice after the bloom fell with copper 5 pounds, lime 5 pounds, water 50 gallons. We had a fair crop of maidenblush; they seemed to ripen prematurely and decay quickly.

Willowtwig was the only winter apple, and not more than 25 per cent. of a crop. They were very knotty, with plenty of bitter rot. If any one can explain the cause of such a failure, I am sure the most of us would be glad to know it.

There is an old saying that "man never gets too old to learn." I will give a little of my experience with strawberries. In the fall of 1899, we had the finest looking strawberry field I ever saw, planted in hills 32 inches each way; not a runner or weed allowed to set; each plant would average 18 to 20 inches across. During the winter we hauled from the

Digitized by Google

stable (which had been heavily bedded with straw) and threw in between and close up to the hills a heavy mulch. There was no mulch over the center or crown of the plant. I was expecting to break all strawberry records. Well, I think I did, for when spring came the plants were like our wheat—gone. Upon examination I found that the crown had been torn from the roots by the freezing and thawing. Consequently I had a very fine melon patch.

Now you may imagine how I felt when I stepped into a neighbor's berry patch in fruiting time to find it simply loaded. He had allowed all runners, as well as weeds and grass, to grow. How shall I prepare for the next crop? I think I know the trouble in my case, after it is too late. The ground had been thoroughly cultivated from early spring until late fall; and not allowing any runners to set, the roots ran down very deep into the soil. I think if I had mulched heavily early, over the hill, this trouble would not have happened.

In the case of my neighbor's patch, the roots from so many runners, the grass and weeds, with the little mulch he gave them, seemed to protect them. I shall try the hill culture again, when I have the assurance of plenty of mulch. I am fully convinced that the hill culture needs heavy mulching early, especially heavy over the hills, which should be taken off from the crown of the plant in the spring.

I do not think the dry weather affects the hill near so much as the matted row. In the latter case the roots run close to the surface, while in hill culture they run very deep.

I have reports of the per cent. of fruit and berry crops from twenty-one counties out of twenty-six in the North Central District. The highest per cent. of fruit is shown by the following table:

Apples—Jay County	75
Pears—Henry County	100
Peaches—Montgomery County	70
Cherries—Boone, Tipton and Randolph	100
Strawberries—Benton, Boone, Delaware, Hancock, Henry and Tippecanoe	100
Raspberries (red)—Hamilton and Tippecanoe	100
Raspberries (black)—Boone, Hamilton and Tippecanoe	100
Blackberries—Boone, Clinton, Grant, Hamilton and Hancock	100
Currants—Benton, Grant and Tipton	100
Grapes—Boone, Grant, Hamilton, Henry, Jay, Randolph and Tipton	100

Digitized by Google

Mr. Davis: I wish to say a word about the "Hoosier banana," the pawpaw. This is a fruit that every one knows, and it seems like there are a few people who know there are as many varieties as trees. Some are a great deal better than others. Two years ago I shipped fifty bushels to Indianapolis, some of them put up in peck baskets and some in half bushel baskets. I would pick them when they would commence ripening. I think I could sell five hundred bushels in the city. I think they are worthy of some notice at least. I sold them at a dollar and twenty cents a bushel, net.

Mr. Henby: Did you grow the trees yourself?

Mr. Davis: They grew wild near the house where we could watch the boys out of them. We did not have to pull them green.

Mr. Henby: Isn't it very difficult to grow?

Mr. Davis: It is very easy to grow from the seed.

Mr. Johnson: Isn't it a fact that it does not take to culture like other fruit and that it has to be out in the woods in a shady place with weeds around it. It is undoubtedly the finest fruit in the world if we simply could propagate it.

Mr. Johnson of Marion County: Judge Hadley told me that he had planted out an orchard in pawpaws four or five years ago, and I want to inquire of some of these Hendricks County people whether you know anything about the result of that orchard of pawpaws.

Mr. Davis: A great many of the trees grew all right, but some were mashed down by the stock, and I think probably a few of them bore this last season. It is no trouble whatever to get them started from the seed, but it is difficult to get them to grow by taking them up. You can plow over a field for ten years, and the pawpaws will come up and you can't kill them. But if you take them up and try to reset them, it is difficult to get them to grow. That was in the garden like a pear or apple tree, and no mulch was around it at all.

Digitized by Google

Dr. Preston: I am very fond of pawpaws. I am interested somewhat in the growing of them from the seed. You can overcome the difficulty in transplanting them, I think, if you take them when quite small. I have a number of them growing in my yard. Only recently I attempted to grow some of them and they are making a very nice growth. They are very slow growers, and I had them in a rather shady place.

The President: When would you transplant them?

Dr. Preston: When they are one year old.

Mr. Phelps: I have planted hundreds of seeds and I never sprouted but one. They run from the main root like sassafras. You find them in dense forests. I have transplanted any quantity of them. I never found but one that came from the seed.

Dr. Preston: I know a man who grew them from the seed because there were no other trees around. You can hardly tell what the roots are, except when you break one and smell it, and then you find the odor of pawpaw.

Professor Van Deman: I grew up among the pawpaw bushes of southern Ohio. I have been acquainted with it ever since childhood. Never but once have I tried to grow the pawpaw in cultivation, and that was in our own garden. We had one tree which came up near an old walnut stump and that protected it from being destroyed by the cultivation of the orchard for a number of years, and it looked so well and behaved so well we concluded to take care of it. It was out in the open just as we have orchard trees, and seemed to flourish, and finally bore fruit abundantly, and that was the only case in which I have ever seen it under cultivation, except in one case in Washington City. I know one tree there in the garden which seems to do well. I have been very much interested in the statements made here about trying to cultivate this fruit as an orchard fruit. I believe there is a future for it like the persimmon. I think Indiana is especially well adapted for the purpose of raising this fruit.

Mr. Kingsbury: At what age does the tree begin to bear?

Professor Van Deman: As I recollect, the tree must have been eight years old.

Digitized by Google

Mr. Tilson: I know all about pawpaws if anybody does, because I have had so much experience with them ever since I was a boy. These pawpaws shown here at the State Fair from year to year come off a tree that grows in my field. That tree will have from one to two bushels on it. It is a very large one. It is almost two feet through. To undertake to raise pawpaws you must put the seed in a little pot, put that in your warming bed in the spring, and when the seed sprouts and there are one or two leaves, take it up carefully and set it out and it will grow without any trouble. Leave them out all winter. If you try to grow them in the sun I think you will make a failure. That is, right in the sun. It is best to plant them in the shade of a forest or orchard. I left a large pawpaw tree in a field when I cleared the field in 1866, the year after I came out of the army. That pawpaw has been there ever since. It is shady on that side of the woods. It has never failed during that thirty years. There are three distinct kinds of pawpaws that I know of. One you don't have to wait for the frost to ripen it. It ripens about the time the Rambo apple does. There is another that ripens a little later, and there is another that is hanging on the bushes yet, and you have to wait until Christmas or January before it can be eaten. I wouldn't try to raise pawpaws in the sun.

Dr. Preston: I believe it is a tree that needs a certain amount of shade. I remember distinctly of gathering pawpaws in pastures where the timber had been cleared out and where the pawpaws grew in clumps and where they shaded themselves out of way from any timber, and they were very nice fruit. I believe in planting the trees close enough together so the trees will shade themselves as well as by the side of a forest. That is an idea I have. I don't know how true it is; I never tried it.

Mr. Teas: There is a pawpaw tree I have known about thirty-five years that is just as much isolated as any tree can be, and it is flourishing. This tree is in Richmond.

The President: I have frequently been at the home of our friend, Mr. Little, the persimmon man, and he is about as enthusiastic on pawpaws as persimmons, and he grows them whenever and wherever he wants to from the seed. He has them growing along the fence, or in the orchard between the orchard trees, and

Digitized by Google

he says the ideal place to grow pawpaws from seed is around the edges of a brush pile so that they can have moisture until they get started.

Professor Van Deman: Some one suggested that it was best to plant the seed and put a barrel without a head over it and leave it there until the tree grew up.

The President: Mr. Little practices that method.

Mr. Johnson: I think Judge Hadley said that was the way he was going to start his orchard.

Mr. Grossman: What amount of fruit, Mr. Davis, does your tree bear?

Mr. Davis: There is a great difference. Some trees bear a half dozen pawpaws, and others a bushel. It depends on the size of the tree, somewhat. These trees we have in the garden now—I think it is four years only—are from the seed, and this last season there must have been a basket full picked. Talk about shading themselves, one of those trees not any taller than my head had more foliage on than some trees have in the woods thirty feet high. The limbs come out symmetrically and there are large, glossy, dark green leaves which you would hardly recognize being a pawpaw. They look more like a young magnolia tree. They adapt themselves to the places where they are, and I think the fruit is better.

Mr. Burton: Let me introduce a new kind of fruit, and one that is not bragged on very much, and that is the black haw. I have found haws growing three times as large as I ever saw before near our former home, and I have procured seeds and expect to plant them.

Mr. Henby: Just one word for the benefit of my friend, Mr. Kingsbury, and perhaps others who are yet prejudiced against the Keiffer pear. If Friend Kingsbury would come to my place, as he used to when he was in politics, I think I could give him lessons on the Keiffer pear which would probably have something to do with removing his prejudices, and that is, how to serve it after it is ripe. It has already been suggested how to ripen it and care for it, etc. We take the cores out and slice them and lay them in a dish and spread nice granulated sugar over them, and it makes a dish good enough to set before a king.

Digitized by Google

VICE-PRESIDENT'S REPORT FROM SECOND DISTRICT.

BY GEO. P CAMPBELL, BLOOMINGTON, IND.

It has been rather discouraging for fruit growers the past season in the Second District.

I have only been in two counties in the district besides my own. Those were Greene and Brown. From my observation in these counties there was not a fourth crop of any fruit except cherries, and possibly strawberries. I have made inquiries as to other parts of the district and have received about the same report.

There was considerable complaint of apples ripening prematurely and dropping off and decaying. Some attributed this to the very warm autumn weather, but the curculio had a good deal to do with it, as they seemed to be worse this year than ever before.

It seems that spraying had very little effect this year. There is an orchard near Bloomington that was sprayed four times and the apples dropped and decayed very badly. Since picking they have nearly all rotted and there is scarcely a perfect apple to be found.

A great many are getting discouraged and say it is no use to try to raise fruit in this country; that it costs more to fight insects than the fruit is worth after they get it.

What can be done to revive new hope in the farmers and fruit growers of the State? Old Indiana has been considered one of the best fruit growing States in the Union, but I fear if something is not done to stop the ravages of insects that we will have to take to the back ground.

Already there are carloads of apples being shipped to Indiana from other States that are retailing at $1.50 to $2.00 per bushel.

Shall we continue to let this vast amount of money go to other States for the fruit that we consume, or shall we make a more determined fight against insects and disease and grow our own fruits?

At the evening session the matter of making the exhibit at the Pan-American Exposition at Buffalo, in 1901, was left to the Executive Committee with power to act.

REPORT OF COMMITTEE ON REVISION OF RULES FOR STATE FAIR EXHIBITS.

BY JOE A. BURTON, CHAIRMAN.

We recommend the following changes:

1. Of crab apples a plate shall consist of ten specimens.

2. That the last sentence in Rule II (Normal size and color of a variety to form the standard of perfection in all cases) be stricken out.

Digitized by Google

3. No award shall be allowed on polished fruit.

4. Russet skin shall not be considered a blemish.

5. That red cider crab be added to the list.

6. That the State be districted by the President into the Southern, Central and Northern, and premiums offered for fruit separately for each district.

On motion, the report of the committee as above given was accepted. Next was an address on

THE PHILOSOPHY OF SPRAYING.

BY PROF. L. R. TAFT, AGRICULTURAL COLLEGE, MICHIGAN.

The act of spraying, as now commonly understood, is the application to trees and other plants of materials known as insecticides, for the destruction of injurious insects, and of fungicides to prevent the attack of parasitic fungi. The remedies are in a liquid form and are applied with a force pump or garden syringe. In order that one may make a rational use of these materials, it is of the utmost importance that the nature of the various pests be understood and that the way in which the different remedies take effect be known.

While nearly all insects and many of the fungi are only found on the exterior of plants, there are some species that pass the greater part of their existence inside their hosts, and can only be reached with spraying compounds, if at all, while on the outside. It is also commonly known that all insects and many fungi pass through several stages of development, and that at some periods they are much more vulnerable than at others. A third and much more important reason why it is necessary to understand the nature and life history of the destructive insects and fungi before attempting to destroy them is that remedies which are found perfectly effective against one form may, on account either of some difference in structure or method of feeding, prove of no value against others. This is especially true with insects, and many of the failures reported in destroying them have been due to the use of materials utterly unsuited to the purpose. The greater portion of our more injurious insects obtain their food by biting off portions of the leaves, fruits or other exterior parts of the plants to which they are injurious, and it has been found that the surest and best method of destroying them is by spraying the plants with some material containing arsenic, just before the damage is likely to occur. Many of the other destructive insects suck the sap from plants, and as it is taken in through a long tube, which they insert into the tissues, it is not possible to reach them with a poison, but reme-

Digitized by Google

dies that kill by contact, or act through the respiratory organs, must be used. In the latter group we find the plant lice and scale insects, while in the former are the larvae of moths and butterflies, and the larval and perfect forms of beetles and other chewing insects.

Until recently the arsenic most commonly used was paris-green. This was applied in water at the rate of one pound in 150 to 200 gallons, or somewhat stronger for the potato beetle and canker worm. A small part of the arsenic found in paris-green is soluble in water, and at first some trouble was experienced from its use upon tender foliage, but it was found that the addition of a pound of lime for each barrel of water would neutralize the arsenic and prevent injury. The use of Bordeaux mixture and other materials containing lime, in connection with the paris-green, will give the same result. Paris-green, when used alone, has but slight adhesive power and hence is readily washed off the plants, but its staying qualities are greatly increased when lime is used with it, and on this account also the addition of lime is desirable. The principal trouble experienced in applying paris-green is from its tendency to settle to the bottom of the barrel or tank used to hold the spraying mixture. A good mechanical agitator should be used, especially if a barrel is employed, while the tendency to settle will be greately reduced if the paris-green is mingled with properly prepared Bordeaux mixture.

Arsenite of lime has for several years been used as a substitute for paris-green. The principal claim made for it being its cheapness, while it is fully as effectual, if not more so, than any of the other arsenical preparations. As white arsenic, from which arsenite of lime is prepared, is slightly soluble in water, it can not be used alone without injury to the foliage, and it must be treated in some way to render it insoluble before it is used in a spraying mixture. Freshly slaked lime has been found to be the cheapest and best material for this purpose. A simple way of preparing arsenite of lime is to place one pound of white arsenic and two pounds of lime, that has been freshly slaked, in two gallons of water, and boil it for forty minutes. This will furnish sufficient arsenic for 200 to 300 gallons of spraying material, although when canker worms or potato beetles are nearly grown it will generally be advisable to increase the strength to one pound in 100 to 150 gallons. In preparing the arsenite of lime a small amount of the arsenic is dissolved in the boiling water. This at once unites with the lime, forming insoluble arsenite of lime, and the water being able to dissolve more arsenic the process is continued until all of it has been changed into arsenite of lime. If added to Bordeaux mixture its bouyancy in the water will be increased, but when added to clear water it remains longer in suspension than does paris-green. Unless the arsenite is used with Bordeaux mixture it

Digitized by Google

will always be advisable to add two pounds of lime to each barrel of water, to lessen the danger of injury to the foliage and to increase its adhesive qualities.

Another method of preparing arsenite of lime is to boil it with three or four times its weight of salsoda and, when the arsenic has dissolved, add the solution either to Bordeaux mixture containing an excess of lime, or to water in which three pounds of lime has been added to each barrel. Nothing is gained by the use of the salsoda, while it adds fifty to seventy-five per cent. to the cost of the spraying material.

Of the remedies against sucking insects, kerosene is most commonly used. Formerly it was emulsified, either with hard soap, soft soap, or whale-oil soap, and diluted according to the nature of the insect and the plants to be sprayed. For many of the plant lice and soft-bodied insects, one part of kerosene can be used in fifteen parts of diluted emulsion, and this can be used with safety upon nearly all plants, but for use upon trees during the growing season it is advisable to increase the amount of kerosene to one part in 10. Against many of the scale insects the best results can be secured with winter applications, when the strength can be increased to one part in four of the diluted emulsion. During the last few years several pumps have been invented for making mechanical emulsions of kerosene and water. The materials are placed in separate receptacles, from which they are drawn into the pump, where they are mingled and forced through the nozzle as a fine mist. All of the pumps do fair work, but they are not entirely satisfactory, as constant watchfulness is required to secure a uniform mixture. The proportions for the mechanical emulsions are the same as given above, and while less likely to injure the foliage than the soap emulsions, they will be found even more effectual as insecticides.

Clear kerosene and crude petroleum have also been used as remedies against scale insects, but while they can be relied upon to kill the insects, great care is required in their use, as they may injure and even kill the trees. The effects vary with the age and species of the trees, as well as with the condition of the growth and the weather at the time the spraying is done.

While many of the chewing insects can be destroyed with kerosene, its use for the purpose is not to be recommended, as it is only effectual against such insects as are upon the trees at the time the spraying is done and as are reached by it; on the other hand, the arsenites are effectual against this class of insects as long as they remain on the trees.

Our cultivated plants are subject to the attack of one or more species of parasitic fungi, which act upon the foliage, fruits or other green parts and not only rob the host plant of the nourishment needed for its growth,

Digitized by Google

but by destroying the tissues, lessens its ability to assimilate food and convey it to the growing portions. When the fruits are attacked serious harm is often done, as in severe cases they may be entirely ruined, and at best they will be reduced in size and rendered unsightly. Among the more troublesome diseases are the mildews and rots of the grape, scab and bitter rot of the apple, leaf-blight and cracking of the pear, leaf-curl of the peach, blight and rot of the potato, and the leaf-blights, commonly called "shot-hole fungi," which attack the plum, cherry, peach, strawberry, raspberry, blackberry currant, gooseberry and other fruits, for all of which effectual remedies have been found. At first thought, the list seems a formidable one and the process of spraying very complex. In fact, the experiments conducted during the past twelve years have greatly simplified the spraying operations. Although one or two others may be occasionally employed, the principal reliance is placed upon a single preparation, and this can be applied at the same time as the arsenites.

Fungi are microscopic plants which penetrate the tissues of their hosts with minute threads and absorb the cell contents. When the conditions are favorable, reproductive bodies known as spores are formed. These are minute structures, generally oval in form, which later on fall or are carried by the wind to healthy portions of the same or other plants, where they germinate and enter the tissues of the new host. A certain amount of moisture and a favorable temperature are required for the germination of the spores. Under suitable conditions the fungi reproduce themselves quickly and thousands of spores may be formed upon a small area.

The extent to which plants are subject to the attack of fungi depends not only upon the conditions being favorable to the growth of the parasites, but, upon their being unfavorable to the growth of the plants themselves. As a rule, when plants have been weakened they are not only more subject to attacks of parasites than those that are making a normal growth, but the injury will be more severe. Lack of plant food or of water, and over-bearing are frequently the cause of weakness in plants, but it may be due to unfavorable climatic conditions or unsuitable soil. On the other hand, it often happens that the plants that are making the strongest growth are most subject to attack. This is especially true during dull, wet weather, when the new tissues are likely to be soft, and afford easy access to the spores of fungi. This is so noticeable that many persons attribute such fungi as leaf-curl of the peach, the blight of the potato, pear-blight and many other diseases, which are seldom troublesome except under certain climatic conditions, to the "weather."

Digitized by Google

Before any attention is given to the use of fungicides, it can be readily seen that every endeavor should be made to first afford, so far as possible, the most favorable environment to the crop. Much can be done by selecting varieties little subject to attack, and by planting them where the soil and elevation are favorable, but the importance of avoiding a check to the growth should not be overlooked. There are a large number of crops that can be saved from the attack of fungous diseases without spraying by controlling the water supply through under-draining in wet soils and for moist seasons, and irrigating when the weather is very dry. Frequent shallow cultivation during periods of drought will often have such an effect in preventing a check to the growth of the crops, by conserving the moisture in the soil, that they may be little if any injured by the attack of fungi, while uncultivated crops, that otherwise are growing under the same conditions, may be runined by them. The supplying of plant food in suitable kind and amounts and preventing the overbearing of the plants, through thinning or pruning, will also be of great value in lessening the check in their growth and preventing injury by fungi.

Under the most favorable conditions, however, there are many crops that can not be grown successfully, unless attention is given to spraying them with suitable fungicides. This is particularly true of our tree and bush fruits, and many of our best growers spray their trees as regularly as they feed their animals. Even though the trees are not in bearing, the spraying is not neglected, as the injury done to the foliage will seriously lessen the growth and prevent, in part if not entirely, the development of fruit buds for the crop of the coming year.

The material most commonly used as a fungicide is sulphate of copper, of blue-stone. It is employed either by merely dissolving it in water, or in a form known as Bordeaux mixture. Whatever form is used, fungicides are only effectual as preventives, as after the spores have germinated and the germ-tubes have worked their way into the host plants spraying will have little effect. The various copper compounds used as fungicides will not only so act upon the spores with which they come in contact as to prevent their germination, but if a leaf has received a thin coating with a fungicide the germ-tubes from spores that fall upon it can not enter its tissues. On the other hand, even though the plants have been sprayed, if the spores fall upon spots that have not been coated with the fungicide, the germination of the spores and the infection of the leaves will not be prevented. From this it will be seen that satisfactory results can not be secured from the use of fungicides unless they are applied early and thoroughly, and the treatment is repeated suffi-

Digitized by Google

ciently often, during the period they are subject to infection, to keep the tissues covered with the fungicide.

To destroy the spores and mycelium that may have wintered upon the twigs, it is advisable to spray the trees in the early spring with a solution of copper sulphate. At this time, it can be used as strong as one pound in 15 to 25 gallons of water, without danger of injury to the bark or buds, and these strengths are commonly used, but from the fact that the germination of nearly all spores can be prevented by the use of solutions containing as little as one part of copper sulphate in 10,000 parts of water, it seems possible that the strength could be considerably reduced without lessening the efficiency of the fungicide. When it is not desirable to use Bordeaux mixture, from fear of spotting the foliage or fruit with lime, a weak solution of sulphate of copper is often substituted, the strength being reduced to prevent injury to the tender foliage. One part in 2,000 parts of water can be used with safety upon all plants that can be sprayed with Bordeaux mixture of standard strength, and if applied as a fine mist, upon warm, bright days, one part to 3,000 parts of water can be used upon any of our fruits. The copper sulphate solutions act quickly, do not spot the foliage, are inexpensive, and are easy to prepare and pleasant to apply, but they are quickly washed from the plants and their effects are not nearly as lasting as the more adhesive Bordeaux mixture.

From the time the growth of the trees starts in the spring, until the first of July, and in some cases the first of August, they should be kept covered with a fungicide, and for this purpose Bordeaux mixture is most commonly used. As usually prepared, it consists of five pounds each of sulphate of copper and lime, in fifty gallons of water, but for use upon tender foliage and late in the season it is advisable to reduce the amount of lime and sulphate of copper to four and even three pounds in fifty gallons of water. Care should be taken to use only a good quality of lime and that it is not air slaked, While a large amount of lime may be slaked and a stock solution of copper sulphate can be made to advantage, it is not advisable to mix any more than will be used during the day.

In preparing the mixture if fifty pounds of sulphate of copper have been dissolved in fifty gallons of water, to make fifty gallons of the mixture five gallons of the solution should be diluted so as to make about twenty-five gallons. What is thought to be an equal amount of lime should also be diluted to the same extent, and the two should be poured together slowly, stirring the mixture thoroughly at the same time. Prepared in this way, the mixture will remain in suspension much longer than when the dilution is made after the lime and sulphate of copper solution have been mixed. If Paris green or arsenite of lime are to be used with Bor-

Digitized by Google

deaux mixture, it is best to add them to the diluted lime water before it is mingled with the sulphate of copper solution.

To prevent injury to the foliage, it is of the utmost importance that a sufficient amount of lime be used to neutralize the copper sulphate, and to determine this a simple test is often used. After the two have been thoroughly mixed, if a few drops of a solution of ferrocyanide of potassium are added, the mixture will turn a chocolate brown if the amount of lime is deficient. To correct the difficulty, it is merely necessary to add more of the lime water, until no change in the color can be produced by the test. Another test is to dip a knife blade, or piece of steel, into the mixture and it will be coated with copper if the lime is deficient.

While a barrel will answer for holding the mixture, if only a few trees are to be sprayed, it is best where the acreage is large to use a half-round stock tank with a tight cover, upon an ordinary farm wagon gear. This will hold enough for several hours' spraying, will make it possible to turn readily in the orchard, and will afford an elevated platform from which to spray. There are several easy working pumps adapted for orchard spraying, which can be operated much easier than those formerly used. The valves and all working parts should be of brass, and they should have provision for attaching at least two lines of hose. Some of the larger pumps will carry four lines. For ordinary orchards, hand pumps will give the best satisfaction. None of the pumps worked by gearing from the wheel will be found desirable for orchard spraying, although for vineyards and bush fruits some of them are fairly satisfactory. A number of spraying outfits using compressed air for propelling the mixture have been tried, and in some respects give excellent results. Gasoline and steam engines for working the pumps have also been considerably used by large growers.

In order that all parts of the trees may be covered it is best to have a nozzle that will make a very fine mist. The Vermorel and Bordeaux nozzles give the best results, and as they are so arranged that two, three, and even four nozzles can be attached to each line of hose, the trees can be covered very rapidly. As it is not possible to throw the spray more than four or five feet with these fine nozzles, it is advisable to use a bamboo or gas-pipe extension rod to elevate the nozzles when spraying tall trees. To hold the pressure and prevent loss of material when passing from tree to tree, there should be a shut-off valve at the lower end of the rod.

The following is suggested as an outline for the spraying of orchards: During the early spring spray all trees and bush fruits with a strong solution of sulphate of copper. For leaf-curl of the peach this should be applied at least three or four weeks before the flower buds open, and one

Digitized by Google

thorough application will suffice. When the flower buds are about one-half developed, but before any of them have opened, spray with Bordeaux mixture and an arsenite; as soon as the fruit has set, repeat the application and in two or three weeks spray again with the same materials. Where the apple scab, codling moth, or any of the leaf-blights are troublesome, it will be advisable to go over the trees early in July, but ordinarily two or three applications of Bordeaux mixture will give quite satisfactory results. Occasionally it will be desirable to use a fungicide when the fruit is nearly grown, and a weak solution of the sulphate of copper may be applied without spotting the fruit. The use of the arsenites and copper preparations, as recommended above, will be found effectual against the codling moth, tent-caterpillar, canker-worm, the curculio of the plum, peach and cherry, and the other troublesome chewing insects. It will also hold in check nearly all of the more troublesome fungous diseases. Careful experiments in the use of Bordeaux mixture show that the foliage can be preserved and a good growth secured, and that 90 to 95 per cent. of the fruit will be free from the injury of fungi, when upon unsprayed trees there will be few leaves, the growth will be short and poorly ripened, and from 90 to 95 per cent. of the fruit will have suffered from the attack of fungi.

The more intelligent and progressive fruit growers already appreciate the importance of spraying their orchards, and they not only receive their rewards in the way of greatly increased cash returns, but they will have the satisfaction that always comes from well-directed, successful efforts.

DISCUSSION.

The President: Will the Bordeaux mixture or copper solution alone kill the spores?

Professor Taft: It will prevent their germinating, and in time will kill them. The main object is to prevent the germination, or if they be germinated, to keep the germs from entering the leaves themselves.

Professor Van Deman: I wish you would state whether you think the use of sal-soda in making this arsenical preparation is valuable or not.

Professor Taft: I have used it, but not for the last three or four years. Professor Van Deman refers to the preparation of arsenic by first dissolving it with sal-soda, using half a pound of

Digitized by Google

arsenic to three or four pounds of sal-soda and making the solution, and then adding the lime in the same way. It is a little easier to dissolve it in that way.

Professor Van Deman: When you have made the solution without the sal-soda I find it best to boil for forty minutes. The object in boiling is to dissolve it rapidly.

Mr. Burton: Are there any poisonous fumes arising in this boiling?

Professor Taft: We have never seen any. We boil it in a comparatively small room, and we still live.

Mr. Tilson: Do you use this copper sulphate solution before the leaves start in the spring?

Professor Taft: Yes, before the buds open. As you are aware, the fungus is upon the leaves, hence you will not have a complete remedy in spraying at this time.

Mr. Burton: Do you spray when the wind is blowing?

Professor Taft: It is utterly impossible to spray against a wind.

Mr. Tilson: Is there any way we common fellows can tell whether white arsenic or paris-green has been adulterated?

Professor Taft: There is no way you can tell certainly, but ordinarily by adding ammonia to a small amount of paris-green, that makes an effective test. Paris-green, if pure, will dissolve in ammonia. It only takes a small amount of the paris-green for the test, and a teaspoonful of ordinary ammonia water is sufficient. You can put it in a glass vessel of any kind.

Professor Green: You will know if there is any sediment it is not pure.

Mr. Swaim: Have you had any experience applying these remedies in dust form?

Professor Taft: I have used quite a number of patent preparations. Many of them applied when the plants are covered with dew will be found quite effectual, but the Bordeaux mixture as a powder is not as effectual as when it is used as a liquid.

Digitized by Google

Dr. Wells: After the use of these arsenical preparations is there any danger to stock pasturing on the grass under the trees?

Professor Taft: Not if the proper amount has been used and has been properly used. Grass beneath such trees has been collected and analyzed, and has been fed to stock.

Professor Cook: Ten years ago I made some very exhaustive tests, using material two or three times as strong as required, and greatly increased the amount of drenching of the trees and ground, and sheep and horses pastured under the trees were not injured.

Mr. Tilson: I have some trees in my orchard that are of no account—the apples are no account. Is it necessary that all that orchard should be sprayed, and is there danger of carrying the spores from those trees not sprayed to the others?

Professor Taft: I think it is desirable to spray all the trees, especially so far as insects are concerned.

Mr. Phelps: Should there be any difference in the strength of the solution for pears, cherries, plums and apples?

Professor Taft: I have used the same with all except the peach and the Japan plum. I reduce the strength for them, although I have used the Bordeaux mixture at the strength I have given you on the Japan plum and had no ill effects. It is much like the peach, however, in its foliage, and I prefer to reduce it to the extent of about one-third, and instead of using five pounds in fifty gallons of water, I would use three.

Professor Van Deman: It is important in this white arsenic preparation with the lime or sal-soda that these ingredients shall stay mixed all through. This is better than paris-green because paris-green has little crystals which settle at the bottom, just as lime settles in the bottom of whitewash. If we use the white arsenic preparation then we have an equally strong preparation for a long time. I don't see why we should use paris-green any more at all.

Professor Taft: I wish that were so, but I hardly think it is the fact. If it were so the arsenic would burn the foliage and it

Digitized by Google

would not be safe to use it. The object of using lime is to neutralize the acid, and keep from burning the foliage. The red color is the test, and if it makes that, you should use more lime.

The President: In regard to the use of paris-green, especially in the past year's experience, we can increase the amount of paris-green to 1¼ pounds in 50 gallons of water, invariably with lime. It counteracts the effect of the arsenic on the apple. I presume we could not use that strength on the plum, the cherry, or the peach—especially the peach. I think we can on the pear. But in some cases we are troubled with certain caterpillars or larvae in the spring. It does not effect the Palmer worm at all, but when we increase it to a pound or pound and a quarter to the barrel, we then find it useful. It takes a very strong dose.

Mr. Davis: I would like to ask the Professor if he has ever found anything in his experience in spraying in the way of causing bitter rot?

Professor Taft: In our orchards we have no trouble from this. We have sprayed all our trees, and have had no bitter rot. In other sections, especially where they are growing the Baldwin, they have some trouble, but they have found that spraying the first part of July has done first-rate. In southern Michigan and the southwest part of the State they have had a good deal of trouble the last two or three years.

Mr. Davis: What do you spray with till the first of July?

Professor Taft: Bordeaux mixture.

Mr. Henby: I would like to ask what you use the Bordeaux mixture on the Japan plum for against the curculio?

Professor Taft: We spray our orchards complete. As we have only small areas of plums I have not taken the trouble to make up a lime preparation designed entirely for the curculio. The use of the Bordeaux mixture will lessen the brown rot, and hence I would spray the plums for that. I do not consider any of these materials entirely effectual against the rot.

Mr. Burton: Can you control the curculio by spraying?

Digitized by Google

Professor Taft: Yes; I think it advisable to spray all our fruit trees with Bordeaux mixture, and we can apply the arsenic with that, and thus increase the efficiency.

The President: I would like to give a little illustration of the idea some people have about spraying. I happened in one of the city stores here in the city in the spring, and there were in that store a couple of farmers from down in the country. One of them wanted to purchase some material to spray plum trees with; the other wanted a pump. The proprietor handed down a small brass arrangement worth about three dollars. He couldn't stand that price; he wanted a little tin pump to cost one dollar, and he wanted to spray his orchard with it. The fellow who wanted the mixture was buying a half gallon of Bordeaux mixture, I think it was in solution, to spray his plum trees for curculio. You see we have not got the people of Indiana up to the proper idea of spraying.

Mr. Johnson: One of our druggists had a preparation of Bordeaux mixture put up by a firm in this town. Is there anything of that kind put up that is reliable? I always made mine. They put it up in pound packages. I don't know whether it is reliable or not.

The President: I know nothing as to the mixture, and can not answer the question. There are dry mixtures of some of these preparations which are all right, and which are put up in good shape.

Mr. Burton: A druggist in our town received some of this dry preparation and gave me a package sufficient for one barrel. I did not use it. The price was to be seventy-five cents; that was about three times what it would cost to make it myself, so I did not care to use it after he gave it to me.

Mr. Phelps: To spray Japan plums with whitewash—would that do any good for the curculio?

Professor Taft: It would help.

Mr. Shoemaker: I would like to ask the Professor about spraying plums, as to when is the best time to spray? I have not been

Digitized by Google

successful in my spraying in fighting the curculio. I have been told that the fault lay in not spraying just at the right time. The curculio you know does not live on the foliage, and therefore I do not know just how to reach it and destroy it.

Professor Taft: One rule is to spray the plum, cherry, pear and apple just before the blossom opens, and just afterward. Regarding the curculio eating the foliage, I am convinced it does in the adult state before it deposits its egg. It is possible, and probable also, that if you spray the trees thoroughly you will place some of the arsenic in the cavity where the egg is laid, and the young larvae will also be killed. I have been able to save a crop of plums in this way. As a rule I would never spray a fruit tree while the petals are showing, yet I sometimes advise it. The reason is that we have in Michigan many orchards infested with canker-worm, and if spraying is neglected they will destroy the foliage, and if you delay the spraying until the blossom has entirely fallen, you may lose the foliage and perhaps the entire crop of the season. We never think of spraying while the flowers are open.

Mr. Shoemaker: Why not?

Professor Taft: So far as insects like the codlin moth are concerned, we get no benefit from it. We must deposit the poison inside of the flower, and this cavity of calyx at that time being occupied with the stamens and pistils, it will not receive the poison. Another reason I would consider of great value is that it destroys the bees and injures the beekeeper, and I consider the honeybee a friend of the fruit-grower in the fertilization of the fruit.

Mr. Simpson: I knew a man in Illinois last year who sprayed a very large orchard after the bloom was half over, and he had a number of stands of bees in the orchard, and he saw no ill effects from that.

Professor Van Deman: I was just over at the Illinois horticultural meeting, and I heard the question squarely put to Professor Blair, at the head of the Horticultural Department of Illinois University, Agricultural College and Experiment Station—did the spraying of the trees while in bloom kill any of the bees? He said he had found that some of the bees had been killed. He

Digitized by Google

did not wish to give a definite statement one way or the other with regard to whether or not spraying should or should not be done at blooming time, because, he said, their experiments had only begun, and they expected to continue them for two or three years before they made a publication on the subject. But he did say they found dead bees under the trees that had been sprayed, and that chemical analyses had been made of those bees, and arsenic was found in the bees.

Mr. Burton: I think with reference to the case Mr. Simpson refers to last spring in spraying apple trees when they were in bloom, that there was nothing in the bloom to attract the bees, and we might have had hundreds of hives in the orchards and sprayed all the time and not have killed the bees. We had an east wind all the time during the blooming period, and except just at the close of the blooming season, the bees did not appear on the blossoms at all.

Mr. Simpson: This man stated that the bees were working in the trees all the time. It killed the codlin moth, and he had good apples and fine ones. I have heard beekeepers say the bees do not eat the honey, but just simply carry it to the hive, and for that reason it did not kill them.

Mr. Davis: I was right in the heart of the fruit district of California two years, and there they paid no attention to the time of the blossoming season that they sprayed, and there they had thousands of stands of bees all over that country, and they claim that the bee sucks the honey through a little tube and it does not enter the mouth or get into the stomach at all. They pay no attention to the blooming. They spray whenever they get ready and as much as they want to. That was a great fruit county and a great bee county. Bakersfield was the place.

Thereupon the convention adjourned until Thursday morning.

Digitized by Google

THURSDAY MORNING.

The report of the Committee on Finance was read and adopted as follows:

We, your Committee on Finance, to whom was referred the Secretary's and Treasurer's reports, have examined the same and find them correct.

GEO. P. CAMPBELL,
SNEAD THOMAS,
AMOS GARRETSON,
Committee.

The report of the Committee on Resolutions was read and adopted as follows:

Whereas, The fruit industry in Indiana seems to be on the decline, and

Whereas, This Society can do but little without money,

Resolved, That we ask the next Legislature to give us an appropriation adequate to our needs, which we think would be $2,000.

Resolved, That every member of this Society constitute himself a committee of one to see his Legislator before the opening of the next session and lay this matter before him.

Resolved, That we try and interest the County Commissioners in a county horticultural experimental station in every county of the State.

Resolved, That we recommend the business of spraying as worthy the attention of young men in all our fruit-growing counties.

MRS. W. W. STEVENS,
H. D. SIMPSON,
J. C. GROSSMAN,
Committee.

PLACE OF SMALL FRUITS IN THE ECONOMY OF THE FARM.

BY JOHN TILSON OF FRANKLIN.

Indiana is justly boastful of her educational system—of its elevating and refining influence. It is no longer regarded sufficient that the youth of Indiana shall be able to read and write and cipher. As a consequence we have high schools and universities. It means not only thorough education, but complete education. It means strength and beauty. It means that in the homes of Indiana there shall be culture and refinement, a taste

Digitized by Google

for and an appreciation of the beautiful in art and nature. Purdue is doing this for our farmer boys and girls, and can and will do more if they can get the proper encouragement from the State. Teach them to love the beautiful in nature, and above all, teach them to love and be contented with their home on the farm. We have made rapid progress in agriculture, and in the raising of fine and improved stock, horses, cattle, hogs and sheep, until Indiana is now right at the top in all of the above, but how is it with horticulture? With the general farmer it is sadly neglected. Especially is this the case with the culture of small fruit. I speak from actual observation that there is not 25 per cent. of the general farmers that raise enough of what we call small fruit—strawberries, raspberries, in fact all the berry family—for their own family use.

Then as to the place of the small fruit in the economy of the farm—the consumption of fruit daily would be conducive to health, especially in the summer and autumn months, from the time strawberries are ripe in May until grapes in August, until, if properly cared for, October and November. Then if eating an abundance of fruit is conducive to health, is it not economy to raise it? If farmers don't raise it they won't have it, for as a rule they will never buy enough for family use. The using of much fruit is not only healthful, but the great pleasure and happiness of raising and having it is worth something. He will learn to love his plants and shrubs, learn to love the beautiful, will want to branch out and raise flowers, if not for his own pleasure, that he may please his wife and daughters, for is not the greatest happiness in making others happy? It is not the fault of woman that there is not always an abundance of fruit and flowers in season on the table at every meal. It is the fault of the man every time. With rural mail every day, with hucksters, coal oil, ice, etc., delivered at the door, there remains no excuse for the man to spend his leisure time in town and at the village store, talking politics and running the government. In winter study and plan how to make home more attractive; then in spring and summer execute these plans. This will help to solve the problem of how to keep the boy on the farm, also another problem, how to keep the wife on the farm. Statistics show that there is a greater per cent. of farmers' wives in insane asylums than of any other calling. Why is this? It is certainly not the hard work, but sameness, doing the same old thing the same old way, diet of hog three hundred and sixty-five days in the year. I had an occasion some time since to canvass our county for a local farmers' insurance company. I stopped one night with a farmer who owned, as he told me, three eighths and a forty—plenty of stock of all kinds. I went out with him to feed. After feeding horses and hogs, he brought a basket of nubbins up a muddy lane to cow troughs, called his wife, and we watched

Digitized by Google

her milk four cows in three to four inches of mud in fence corners. After supper I ventured to ask (for I saw he had none) why he had never set out any small fruit—strawberries, for instance. His answer was, " 'Cause 'twon't pay; no money in it. I bought a quart of strawberries last summer; just a waste of sugar." Then the old lady let loose. "No, there is no fruit nor a flower on this farm, except what few apples on them trees out there, planted over forty years ago. It's just work, work here until sometimes I think I can't stand it any longer. I want to move to town; he won't do that."

In a short time after that the old lady was taken with what the doctor called nervous prostration, lost her mind, is now gone, we hope, to a happier land, where her toils are over. There is economy in raising small fruit on the farm; if rightly managed it can be made a source of revenue. It does not necessarily take the time of the farmer from other duties. The planting comes at a leisure time. We can always get boys and girls who need the work to pick our berries. There never has been a time in my locality, and I don't think will be soon, when we can't sell enough right at home to more than pay for picking and for sugar to put up our own fruit. But, laying aside all money value, can not we claim for horticulture a heaven-ordained rank such as belongs to no other occupation known to the human family. Did not God himself plant the first garden and there put man, whom he had formed? "And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food," the second chapter of Genesis, fifteenth verse, reads; "and the Lord took the man and put him in the garden of Eden to dress it and to keep it."

Mr. Campbell: I want to ask a question or two with reference to the small fruits, such as strawberries and raspberries, and I want to ask what the prospect is for next year's crop. One of my neighbors, one of the largest raspberry growers in our county, claims his raspberry canes are already dead. He has cut part of them down already. He is at a loss to know what is the matter. He told me he never had a finer crop than this year. The leaves dropped prematurely, and then the fall rains set in and they started new leaves so late they did not amount to anything. Since that his canes have all died. I would like to know if anyone knows the cause?

The President: I suspect the cause is the anthracnose. It is a fungus. It is very common over the State.

Digitized by Google

Mr. Henry: You remember a year ago last winter we had a severe winter and continued cold weather. It was below zero for several weeks and no snow. That winter no doubt hurt the raspberries and grapes and blackberries. It hurt their roots, and I don't think they have got over it yet. I know my grapes have not. Last year all through our neighborhood the grapes were almost an entire failure, and I think it was on account of the cold, hard freezing.

The President: No doubt that had quite a good deal to do with the weakened condition of the canes.

Mr. Henby: The moral is, do not cultivate your raspberries and blackberries and grapes, etc., too late in the season. Let the weeds and grass grow around their roots, as they are a good protection.

Mr. Reed: I think the anthracnose has more to do with it than anything else. I have had two acres this season that made an exceedingly good growth. They are one-half dead now. I have also another half acre in an orchard, and when spraying the orchard I spray the raspberries. That patch has done better this season than ever before. Off of three-fourths acre I picked 100 cases of 24 quarts each, and they are in equally as good shape for the coming season. Those that were not sprayed at all show very bad.

Snead Thomas: I have in mind two raspberry growers in my locality; one adjoins my place, and he is a rather careless cultivator; he has the anthracnose very bad. I made the remark the other day that if those were my raspberries I would plow them down. There is another man a mile further south who has been very careful in keeping the anthracnose stamped out, and he has as fine raspberries as I ever saw.

Mr. Henby: There is only one sure preventive for anthracnose, and that is thorough cultivation. If we want to protect our raspberries in winter we sow oats in August. We also do that with our strawberries.

Mr. Kingsbury: When do you sow the oats?

Mr. Henby: Anywhere from the 1st to the 20th of August.

Digitized by Google

The President: If there is no snow it becomes very important that we have some artificial mulch to take the place of snow. The oats will do that very effectually, and it is dead in the spring and out of the way when you want to cultivate.

Mr. Swaim: While I believe thoroughly in cultivation, I can not agree with Mr. Henby that cultivation is a sure preventive of anthracnose, because I have seen it very bad on the ground of some of our best cultivators. I believe the only real remedy is the Bordeaux mixture.

Mr. Phelps: Did any one ever try the sowing of turnips about the first of August for mulch?

The President: That is all right.

Mr. Swaim: Wouldn't there be danger of those turnips making a growth that would be difficult to get out? Oats will winter kill throughout this country.

Mr. Henby: Anything that will form a good mulch will serve the purpose. I have seen rye that makes a splendid protection, and then, say in May when it is about to head, mow it down with the scythe, and you have a protection against drouth.

The President: The trouble with rye or any of those crops is they are in the way of cultivating in the spring. The oats is out of the way.

Mrs. Stevens: I don't believe ten per cent. of the average farmers of the United States grow strawberries. But the average farmer is not here. I think the "average" farmer is the fellow we ought to strike for if we are going to do missionary work, and if the "average" farmer's wife could be convinced of the amount of lusciousness she could get from the strawberry, I think she would make it very warm for her husband so that he would be glad to raise strawberries. If the "average" farmer knew he could raise strawberries as easily as he can cabbage—and I do not believe but what the majority of people will agree to that—he would grow them, but not for the market. I do not believe it possible for the "average" farmer to grow any kind of fruit unless it is tree fruit, and I do not believe he can grow tree fruit profitably for market,

Digitized by Google

for just at the time his fruit needs attention his crops need attention. It is one person's business to do the growing and another's to do the peddling. In our part of the country, and I think all through the southern part of the State, the growers are not selling their own fruit. We have fruit men who come around and buy the fruit at the orchards, and do the shipping and the peddling. The average fruit man grows and supplies his home market—that is the most profitable—and I suggest that he does not attempt to go further than that.

Mr. Anderson: I have supported a large family by small fruit raising for twenty years. I have raised all kinds of small fruit that can be raised at any profit in Indiana. Now, if you remember, some years ago you had what you called a "star list." Some one a few years ago said that did not mean anything. I beg the gentleman's pardon. I began twenty years ago. I was not only a beginner, but a new beginner, and green as a gosling in the matter. The result was that I had to depend on somebody for information, and I want to say for your good, and perhaps I may add for your glorification, that I found double starred fruit, plenty of it. I did this after having gathered up a number of your old proceedings, and I have never failed in success wherever I have planted a double-starred fruit, and I have planted a number of them, and I have frequently failed when I did not do that. My difficulty especially has been in strawberries. I raise the Warfield and Haverland for the main crop. My market demands a cheap berry and I prolong my season with the Gandy, which is one of the finest of small strawberries. I am not going to ask you if you have anything better. I do not want anything better. All I want in the way of improvement of my strawberries is to get one that will last the year round. My patrons never get tired of crying for strawberries. I have used the Clyde a few years, and it is a perfect failure with me.

Professor Troop: I think the Clyde is one of the best berries that we can grow for the soil we have.

Mr. Davis: There is a wonderful difference in the strawberry. I have tested in the last twelve years over seventy varieties. The soil has a great deal to do with it. I do not see how you can set down any rule to go by with reference to the strawberry. The

Digitized by Google

Brunette, to my notion, and that of all my customers, is one of the best berries that grows.

The following officers were elected:

C. M. Hobbs, President.
James Troop, Secretary.
Sylvester Johnson, Treasurer.
Mrs. W. W. Stevens, First Vice-President.
Geo. B. Campbell, Second Vice-President.
Amos Garretson, Third Vice-President.
J. C. Grossman, Fourth Vice-President.
E. Y. Teas, Joe A. Burton, L. B. Custer, Executive Committee.

The President, the Secretary and Mrs. W. W. Stevens were appointed a Committee on Experimental Orchard.

The following memorandum of awards to Indiana exhibitors of fresh fruits at Paris Exposition, 1900, was received and read:

TEMPORARY COMPETITION, MAY 9, 1900.

Indiana Horticultural Society awarded second prize.

Apples, Crop of 1899, Ten Varieties, Displayed in Quantity.

Variety.	*Contributor.*	*Address.*
Baldwin	T. T. Newby	Carthage, Ind.
Ben Davis	T. T. Newby	Carthage, Ind.
Black	T. T. Newby	Carthage, Ind.
Golden Russet	T. T. Newby	Carthage, Ind.
Hubbardston	T. T. Newby	Carthage, Ind.
Indiana Favorite	T. T. Newby	Carthage, Ind.
Lansingburg	T. T. Newby	Carthage, Ind.
Mann	T. T. Newby	Carthage, Ind.
Newby	T. T. Newby	Carthage, Ind.
Salome	T. T. Newby	Carthage, Ind.

TEMPORARY COMPETITION, MAY 23, 1900.

Indiana Horticultural Society awarded second prize.

Apples, Crop of 1899, Five Varieties, Displayed in Quantity.

Variety.	*Contributor.*	*Address.*
Ben Davis	Albert Brown	Alquina, Ind.
Mountjoy	Jesse P. Elliott	Alquina, Ind.
Smith Cider	Elias Scholl	Alquina, Ind.
White Pippin	Ross Thomas	Alquina, Ind.
York Imperial	Joseph Rutherford	Alquina, Ind.
York Imperial	Joseph Rutherford	Alquina, Ind.

Digitized by Google

TEMPORARY COMPETITION, MAY 23, 1900.

Thomas T. Newby, Carthage, Indiana, awarded second prize.

Apples, Crop of 1899, Nine Varieties, Displayed in Quantity.

Variety.	*Contributor.*	*Address.*
Baldwin	Thomas T. Newby	Carthage, Ind.
Ben Davis	Thomas T. Newby	Carthage, Ind.
Black	Thomas T. Newby	Carthage, Ind.
Golden Russet	Thomas T. Newby	Carthage, Ind.
Hubbardston	Thomas T. Newby	Carthage, Ind.
Indiana Favorite	Thomas T. Newby	Carthage, Ind.
Lansingburg	Thomas T. Newby	Carthage, Ind.
Mann	Thomas T. Newby	Carthage, Ind.
Salome	Thomas T. Newby	Carthage, Ind.

TEMPORARY COMPETITION, MAY 23, 1900.

Single Baskets of Apples—Awarded Honorable Mention.

Variety.	*Contributor.*	*Address.*
Newby	T. T. Newby	Carthage, Ind.

TEMPORARY COMPETITION, JUNE 27, 1900.

Indiana Horticultural Society awarded second prize.

Apples, Crop of 1899, Five Varieties, Displayed in Quantity.

Variety.	*Contributor.*	*Address.*
Ben Davis	C. Rodenburg	Richmond, Ind.
Ben Davis	Alice Eliason	Richmond, Ind.
Ben Davis	Richard Sedgwick	Richmond, Ind.
Gilpin	Richard Sedgwick	Richmond, Ind.
Indiana Favorite	Dill Addleman	Richmond, Ind.
Mann	Columbus King	Centreville, Ind.
Stark	Dill Addleman	Richmond, Ind.

TEMPORARY COMPETITION, AUGUST 8, 1900.

Joe A. Burton, Orleans, Indiana, awarded second prize.

Apples, Crop of 1899, Two Varieties, Displayed in Quantity.

Variety.	*Contributor.*	*Address.*
Ben Davis	Joe A. Burton	Orleans, Ind.
Winesap	Joe A. Burton	Orleans, Ind.

TEMPORARY COMPETITION, OCTOBER 24, 1900.

Joe A. Burton, Orleans, Indiana, awarded first prize.

Collection of Apples, Crop of 1900.

In addition to the foregoing awards to Indiana fruit growers, in their individual capacity, or as contributors to the Indiana Horticultural Society's collections, the following varieties and contribu-

Digitized by Google

tors have entered into the several competitions made by the Division of Pomology, U. S. Department of Agriculture, to which prizes have been awarded:

COMPETITION OF MAY 9, 1900.

Variety.	*Contributor.*	*Address.*
Baldwin	T. T. Newby	Carthage, Ind.
Black	T. T. Newby	Carthage, Ind.
Golden Russet	T. T. Newby	Carthage, Ind.
Hubbardston	T. T. Newby	Carthage, Ind.
Lansingburg	T. T. Newby	Carthage, Ind.
Mann	T. T. Newby	Carthage, Ind.
Newby	T. T. Newby	Carthage, Ind.
Salome	T. T. Newby	Carthage, Ind.

COMPETITION OF MAY 23, 1900.

Ben Davis	Albert Brown	Alquina, Ind.
Mountjoy	Jesse P. Elliott	Alquina, Ind.
Smith	Jesse P. Elliott	Alquina, Ind.
White Pippin	Ross Thomas	Alquina, Ind.
York Imperial	Wm. Newland	Alquina, Ind.
York Imperial	Ross Thomas	Alquina, Ind.

COMPETITION OF JUNE 13, 1900.

Black	George Ebersoll	Centreville, Ind.
Indiana Favorite	Chas. Rodenburg	Richmond, Ind.
Seedling No. 1	Enos Kitterman	Centreville, Ind.
Seedling No. 2	Enos Kitterman	Centreville, Ind.
Smith	Elmira Russell	Richmond, Ind.

COMPETITION OF JUNE 27, 1900.

Ben Davis	Richard Sedgwick	Richmond, Ind.
Ben Davis	Chas. Rodenburg	Richmond, Ind.
Ben Davis	Alice Eliason	Richmond, Ind.
Gilpin	Richard Sedgwick	Richmond, Ind.
Indiana Favorite	Dill Addleman	Richmond, Ind.
Indiana Favorite	Alice Eliason	Centreville, Ind.
Mann	Columbus King	Centreville, Ind.
Smith	R. Sedgwick	Richmond, Ind.
Smith	Dill Addleman	Richmond, Ind.

COMPETITION OF JULY 18, 1900.

Indiana Favorite	Dill Addleman	Richmond, Ind.
Stark	Dill Addleman	Richmond, Ind.

COMPETITION OF AUGUST 8, 1900.

Winesap	Joe A. Burton	Orleans, Ind.

Digitized by Google

COMPETITION OF AUGUST 22, 1900.

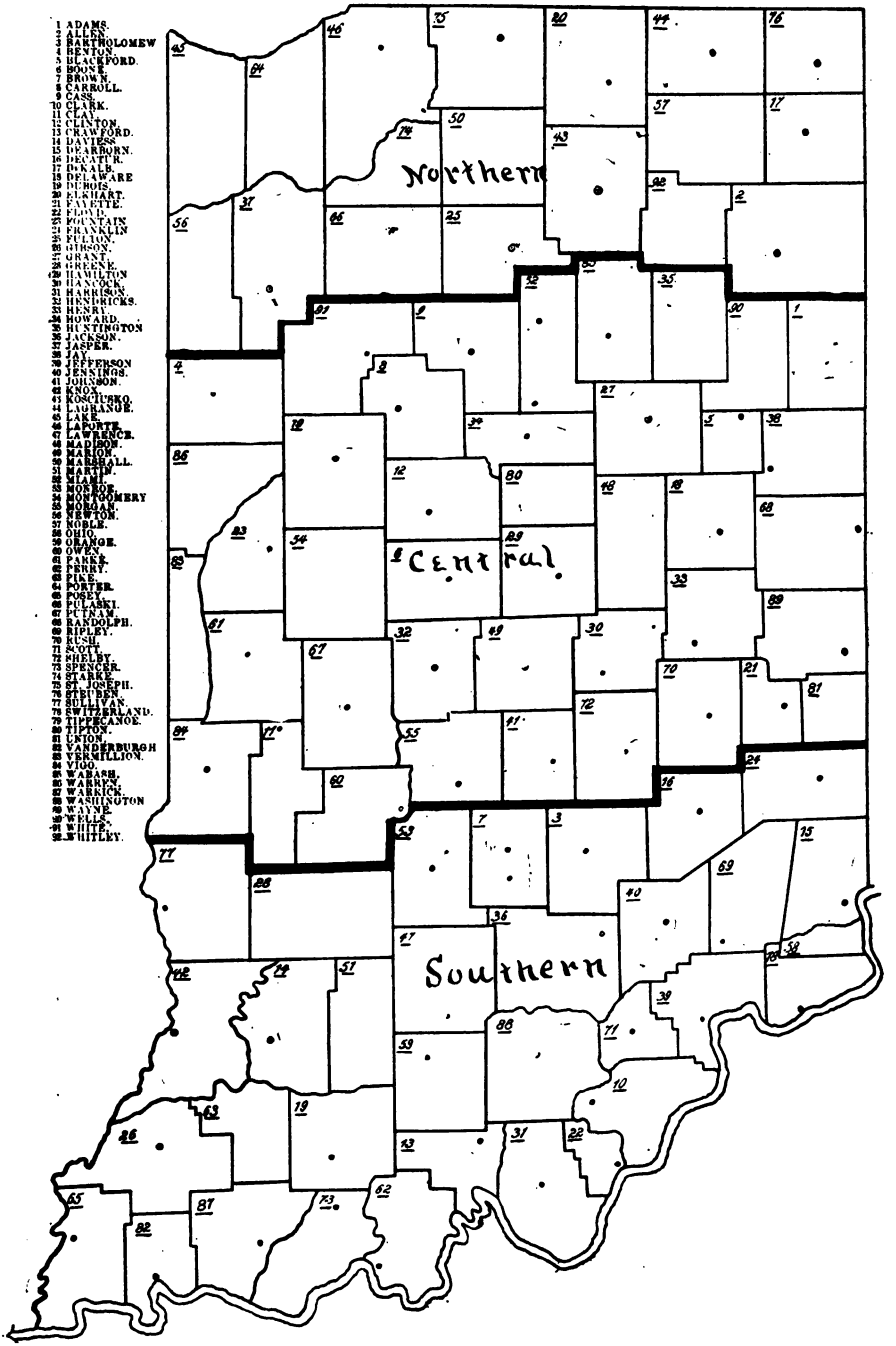
Variesy.	*Contributor.*	*Address.*
Winesap	Joe A. Burton	Orleans, Ind.

COMPETITION OF OCTOBER 10, 1900.

Ben Davis	Joe A. Burton	Orleans, Ind.
Ralls *Genet*	Joe A. Burton	Orleans, Ind.
Rome Beauty	Joe A. Burton	Orleans, Ind.
Winesap	Joe A. Burton	Orleans, Ind.

Following is a map of the State showing the three fruit sections into which the State has been divided, in accordance with the report of the committee found on page 152 of this volume; and also a list of varieties which are recommended for each district:

Digitized by Google



MAP SHOWING FRUIT DISTRICTS.

Digitized by Google

VARIETIES OF FRUITS IN DISTRICTS.

NORTHERN DISTRICT.

APPLES.

Summer.—Red Astrachan, Chenango, Yellow Transparent, Tetofsky, Red June, Sweet Bough, Early Harvest, Benoni, Oldenburg, Summer Queen, Golden Sweet.

Autumn.—Fameuse, Maiden Blush, Sweet Russet, Wealthy, Fall Pippin, Twenty-Ounce, Longfield, Rambo, Fall Wine, Gravenstein, Keswick Codlin, Alexander.

Winter.—Ben Davis, Northern Spy, Limber Twig, Willow Twig, Smith Cider, R. I. Greening, Yellow Bellflower, Rox. Russet, Hubbardston, Grimes Golden, Jonathan, Vandevere, Talman Sweet, Starke, Rome Beauty, King, Esopus Spitzenburg, Fallawater, Wagener, Peck's Pleasant, Mann, Roman Stem, York Imperial, Swaar, Canada Red, Pewaukee, Wolf River, Sutton Beauty, Salome.

Crabs.—Hyslop, Transcendent, Whitney, Martha.

PEARS.

Bartlett, Keiffer, Angouleme, Koonce, Sheldon, Flemish Beauty, Clairgeau, Clapp, Seckle, Diehl, Onondaga, Anjou, Wilder, Howell, Lawrence.

PEACHES.

Crawford (late), Mountain Rose, Stump, Yellow Rareripe, Lemon Free, Barnard, Salway, O. M. Free, O. M. Cling, Elberta, Foster, Early York, Champion, Crosby, Heath Cling, Smock, Swan's Orange.

PLUMS.

Lombard, Green Gage, Burbank, Bradshaw, Wild Goose, Robinson, German Prune, Shropshire Damson, Newman, Gull, Abundance, Yellow Egg, Grand Duke, Imperial Gage, Pond's Seedling, Blue Damson, Ogon.

CHERRIES.

Early Richmond, Montgomery, May Duke, Louis Phillippe, Gov. Wood, Dyehouse, Black Tartarian, English Morello, Windsor.

GRAPES.

Concord, Worden, Moore's Early, Hartford, Ives, Moyer, Delaware, Niagara, Brighton, Diamond, Pocklington, Agawam, Salem.

GOOSEBERRIES.

Downing, Houghton, Red Jacket, Champion, Pearl, Champion.

Digitized by Google

QUINCES.

Orange, Champion, Meech.

CURRANTS.

Victoria, Fay, Cherry, Red Dutch, Pomona, White Grape.

BLACKBERRIES.

Snyder, Eldorado, Stone Hardy, Agawam, Lawton, Ancient Briton, Taylor.

RASPBERRIES.

Black.—Gregg, Kansas, Ohio, Eureka, Nemaha, Conrath.

Red.—Cuthbert Louden, Shaffer, Columbian, Turner, Golden Queen, Miller's Red.

STRAWBERRIES.

Warfield, Bubach, Jessie, Cumberland, Parker Earle, Haverland, Greenville, Gandy, Brandywine, Lovett, Enhanse, Splendid.

CENTRAL DISTRICT.

APPLES.

Summer.—E. Harvest, Yellow Transparent, Benoni, Tetofsky, Chenango, Golden Sweet, Sweet June, Duchess, Red Astrachan, Early Joe, Kirkbridge, Red Stripe, Benoni, Red June.

Autumn.—Maiden Blush, Rambo, Wealthy, Gravenstein, Fall Orange, Flory Bell, Fall Wine, Bellflower, Fameuse, Porter.

Winter.—Grime's Golden, York Imperial, Rome Beauty, Stark, Ben Davis, Ind. Favorite, Lansingburg, Roman Stem, Northern Spy, Winesap, Smith's Cider, Clayton, Moore's Sweet, W. Pippin, Fallawater, Greenville, Mann.

Crabs.—Martha, Transcendent, Whitney, Florence, Hyslop.

PEARS.

Flemish Beauty, Bartlett, Tyson, Keiffer, Lawrence, Howell, Sheldon, L. Bonne, Seckel, Clapp, Wilder, Arnold, Koonce, Vt. Beauty.

PEACHES.

Elberta, Crosby, Old Mixon, Stump, Mt. Rose, Kilbourn, Smock, E. and L. Crawford, Crosby, Alexander, Beatrice, Gold Drop, Kalamazoo, Champion, Snead, Triumph, Fitzgerald, St. John.

PLUMS.

Newman, Damson, Robinson, Lombard, Moore's Arctic, Imp. Gage, Ogon, Burbank, Abundance, Shipper's Pride, Shropshire Damson, German Prune, Lincoln, Red June, Wicksan.

Digitized by Google

CHERRIES.

Early Richmond, Montmorency, Late Morello, Dyehouse, English Morello, Gov. Wood.

QUINCES.

Missouri Mammoth, Orange, Champion, Meech.

GRAPES.

Concord, Worden, Moore's Early, Brighton, Ives, Niagara, Campbell's Early, McPike, Pocklington, Diamond, Woodruff Red, Delaware, Salem, Brilliant, Cottage, Early Victor, Green Mt., Eaton, Agawam.

CURRANTS.

Pomona, Wilder, Victoria, White Grape, Cherry, Versailles, Red Dutch.

GOOSEBERRIES.

Downing, Houghton, Champion, Pearl, Red Jacket.

BLACKBERRIES.

Snyder, Taylor, Ancient Briton, Stone's Hardy, Eldorado, Early King, Erie, Agawam.

RASPBERRIES.

Black.—Gregg, Kansas, Hilborn, Hopkins, Eureka, Conrath, Nemaha.

Red.—Cuthbert, Turner, Golden Queen, Miller's Red, Loudon, Shaffer, Columbian.

STRAWBERRIES.

Warfield, Haverland, Bubach, Phillips, Greenville, Gandy, Lovett, Parker Earle, Mary, Cumberland, Brunette, Enhance.

SOUTHERN DISTRICT.

APPLES.

Summer.—Summer Rose, Yellow Transparent, Benoni, Early Harvest, Sweet Bough, Tetofsky, Red Astrachan, Red June, Chenango, Oldenburg, Bailey Sweet.

Autumn.—Maiden Blush, Rambo, Fall Pippin, Gravenstein, Fall Wine, Tulpehocken, Golden Sweet, Grime's Golden, Wealthy.

Winter.—Ben Davis, Rome Beauty, Winesap, Willow Twig, Smith's Cider, Minkler, Vandevere, Golden Russet, York Imperial, Ind. Favorite, Winter Pearmain, Stark, Jonathan, Genet, White Pippin, Yellow Bellflower.

Crabs.—Whitney No. 20, Transcendent, Hyslop, Virginia Seedling, Kentucky Red Cider.

Digitized by Google

PEARS.

Bartlett, Clapp's Favorite, Wilder, Flemish Beauty, Anjou, Seckel, Keiffer, Clairgeau, Louise Bonne, Belle Lucrative, Mt. Vernon, Angouleme.

PEACHES.

Elberta, Crosby, Old Mixon Free and Cling, Crawford, Champion, Smock, Stump, Alexander, Honest John, Flenor, Salem, Amsden, Troth's Early, Heath Cling, Snow, Yellow Rareripe, Globe, Lemon Free, Lovett's White, Wonderful, Summer Snow.

PLUMS.

Lombard, Abundance, German Prune, Green Gage, Moore's Arctic, Shipper's Pride, Yellow Egg, Ogon, Imperial Gage, Miner, Wild Goose, Newman, Burbank, Damson, Robinson.

CHERRIES.

Early Richmond, English Morello, Montmorency, Black Tartarian, Gov. Wood, Dyehouse, Windsor, Yellow Spanish.

QUINCES.

Orange, Missouri Mammoth, Champion.

GRAPES.

Concord, Worden, Niagara, Moore's Early, Diamond, Delaware, Norton's Virginia, Catawba, Pocklington, Clinton, Brighton, Ives, Prentiss, Hartford, Lady, Perkins, Martha.

CURRANTS.

Red Dutch, Fay's Prolific, North Star, Cherry, White Grape, Pomona, Versailles.

GOOSEBERRIES.

Industry, Downing, Houghton, Champion, Crown Bob.

BLACKBERRIES.

Taylor, Snyder, Erie, Wilson Jr., Stone Hardy, Early Harvest, Early King, Ancient Briton, Lawton, Eldorado.

RASPBERRIES.

Black.—Gregg, Ohio, Kansas, Conrath, Eureka.

Red.—Royal Church, Cuthbert, Shaffer, Columbian, Miller's Red, Turner, Brandywine.

STRAWBERRIES.

Cumberland, Crescent, Jessie, Bubach, Haverland, Warfield, Enhance, Gandy, Sharpless, Parker Earle, Greenville.

Digitized by Google

THE ORIGINAL CONCORD GRAPE VINE.

CHAS. E. NEWLIN IN INDIANA FARMER.

I thought your readers might be interested in a little "horticultural history" which has been of great interest to me. Perhaps few of those who annually feast on the luscious Concord grapes ever stop to think where the variety originated or when or by whom it was first cultivated. An hour's ride northwest from Boston, through historic old Cambridge and Lexington, is this quaint little scattered town of Concord, where the first battle of the Revolution was fought, April 19, 1775, though the little skirmish at Lexington on the way out here is usually given that distinction. After a walk out two miles over the fir covered hill to Walden Pond, where Thoreau's happy hours were spent in the litle hut on its shores, and back to a New England dinner in Wright Tavern, built in 1747 and used ever since as a tavern (it was here the English General Pitcairn got drunk before the battle of Concord), I wandered out the old Lexington road, past Emerson's home, where his daughter still lives, and past the Alcott home, where "Little Women" was written, and in whose dooryard, by the foot of the hill, stands the plain unpainted "Concord School of Philosophy." A little farther on is "Wayside," the "House of Seven Gables" (and it has them), where Hawthorne wrote "Scarlet Letter" and where his daughter, Mrs. Lothrop, still lives.

Next door to this historic house stands "Bull's Cottage," in whose door yard still grows the first "Concord" grape vine, from which stock the unnumbered millions of vines of this variety came. The vine is now enclosed in close lattice work, around and above, to keep vandal relic-hunters, like myself, from carrying it away by inches. On one side hangs a square oak board on which these words are burned most artistically: "I looked about to see what I could find among our wildings. The next thing to do was to find the best and earliest grape, for seed, and this I found in an accidental seedling at the foot of the hill. The crop was abundant, ripe in August, and of a very good quality for a wild grape. I sowed the seed in the autumn of 1843. Among them the Concord was the only one worth saving. Ephriam Wales Bull."

This is the simple story of the origin of the greatest grape ever produced. Mr. Bull was born March 4, 1806, and died September 26, 1895. Mrs. Lothrop then bought the grounds of her father's old friend, and is keeping the quaint old cottage and its surroundings in perfect repair, just as Mr. Bull left them, except for a little addition to the back for the accommodation of the renter. On the mantle piece in the sitting room she has had daintily painted this "confession" of Mr. Bull: "I confess I did not expect to arrive at so great a success so soon, but when I had the good fortune to find the Concord among the first crop of seedlings, the thought dawned upon me that in the perhaps far off future higher success awaited the cultivator who had the patience to wait, I had almost said also the courage to venture, for I was sensible that any attempt to improve the wild grape would be considered an imputation upon the judgment and sagacity of the operator. Fully aware of this, I kept my own counsel, and if I had not succeeded nobody would have known that I had ventured."

Digitized by Google

And above the old fire place in the dining room is painted: "Final summing up of 37 years work from over 22,000 seedlings, 21 grapes which in the light of to-day I consider valuable. I had at one time 125 vines which I thought worth saving, but, grown more critical with every new success, I have discarded most of them." What a world of patience and love of his work this discloses; I was told by one of Mr. Bull's old neighbors that the original wild grape which was found ripening in August Mr. Bull found on the banks of Concord River, just a little above the old bridge where the "Battle of Concord" was fought and where now stands that marvelously beautiful statue, "The Minute Man," on the base of which is carved:

"By the rude bridge that arched the flood,
Their flag to April's breeze unfurled,
Here once the embattled farmers stood,
And fired the shot heard round the world."

Just across the meadow on the little hill stands "The Old Manse," sacred to all lovers of good literature.

Knowing the classic surroundings of the birth of the Concord grape, perhaps some of our readers will enjoy a little more the refreshing fruit from their own vine descended from this parent vine, which old Ephraim Wales Bull gave to the world 58 years ago.

Digitized by Google

REPORT OF THE STATE ENTOMOLOGIST.

[Submitted to the Horticultural Society for publication.]

To His Excellency, James A. Mount, Governor of the State of Indiana:

Sir—In accordance with the provisions of section eleven (11), chapter thirty-eight (38), of the General Laws of 1899, I herewith submit my second annual report of work done and expense incurred by this office during the fiscal year ending October 31, 1900. Section 1 of the Nursery Inspection Laws reads as follows:

> Be it enacted by the General Assembly of the State of Indiana, That all nurseries in Indiana where trees, shrubs, vines, plants or other nursery stock are grown and offered for sale, shall be inspected by the State Entomologist at least once each year, not earlier than June 1, nor later than October 1, at such times as he may elect, and he shall notify in writing the owners of such nurseries, the Secretary of the State Board of Agriculture, the director of the State Agricultural Experiment Station and the President of the State Horticultural Society of the presence of any San Jose scale or other destructively injurious insects or fungi on trees, shrubs, vines, plants or other stock of such nurseries, and shall notify, in writing, the owner of any affected stock that he is required on or before a certain day to take such measures for the destruction of such insects or fungous enemies of nursery stock as have been shown to be effectual for this purpose.

Section 8 reads in part as follows:

> Whenever a nurseryman, fruit grower or agriculturist in this State shall know or have good reasons to believe that his trees, shrubs, vines or plants are affected with San Jose scale, yellows, rosette, or other destructive insects or fungus enemies, he shall have the privilege, and it shall be his duty to notify the State Entomologist, who shall proceed in person or by his assistant, to examine the same without delay, and advise the proper remedies for the destruction of such insects or fungus enemies of nursery stock that may be present.

It will be seen that there are two principal objects in view: First, to prevent so far as possible the further introduction of San Jose scale and other injurious insects, etc., into the orchards of the

Digitized by Google

State from infested nurseries located in other States; and, secondly, to eradicate or prevent the further spread of these pests of the orchard, so far as possible, wherever they have already gained a foothold. Unfortunately, however, the law was not passed until the San Jose scale had become generally scattered over the State, as recent experience has demonstrated.

In order to prevent the further introduction of the scale into the State, all transportation companies are prohibited from delivering any consignment of uncertified stock originating in other States. Soon after the passage of this act, forty transportation companies doing business in this State were notified from this office, and with but very few exceptions, so far as has come to my knowledge, the law has been generally respected. These few exceptions have been more on account of negligence than a willful violation of the law. I am told that some of the Ohio river packet companies have frequently violated the law in this particular, but I have been unable to secure any positive proof to that effect.

In order to effectually accomplish the second purpose, the State Entomologist or his assistants are authorized to enter upon any premises where the San Jose scale or other dangerously injurious insects or plant diseases are believed to exist, and "any person or persons who shall obstruct or hinder said State Entomologist or his assistant in the discharge of their duties, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than ten or more than twenty-five dollars." In case the owner of any infested stock does not apply the remedies prescribed by the State Entomologist within a specified time, he is thereby made liable to a fine of not more than twenty-five nor less than ten dollars. This last provision has proved very helpful in enabling us to enforce the law in several instances where the owners of trees were either obstinate or indifferent concerning the matter.

It will be noticed that Section 1 of this act provides that all nurseries of the State shall be inspected at least once each year, not earlier than June 1 nor later than October 1. The act also provides that whenever a nurseryman or seller of trees, shrubs, vines, plants or other nursery stock, who is a resident of this State, shall ship or deliver any such goods, he shall send on each package so shipped or delivered a written or printed certificate stating that such stock has been examined by a State or Government Entomolo-

Digitized by Google

gist and found, to the best of his knowledge and belief, to be free from San Jose scale or other destructively injurious insects or fungus enemies. By a general agreement entered into by a number of the State Entomologists of the Eastern and Middle States, a certificate of inspection signed by any one of said State Entomologists shall be valid in any other State requiring a similar inspection. It has recently developed, however, that the time limit for the inspection fixed by some States does not correspond with that of other States; hence a meeting of all the State Entomologists east of the Rocky Mountains, has been called for January 4 at Chicago, for the purpose of unifying the laws of the various States in this as well as some other respects, so as to make them more generally effectual in accomplishing the ends sought.

The following is a list of official nursery inspectors which has been furnished to Indiana nurserymen and dealers:

To Indiana Nurserymen:

Whenever any nursery stock and other horticultural products imported into this State bears a certificate of apparent freedom from dangerous insects and contagious plant diseases signed by one of the inspectors on the following list and dated not earlier than the July last preceding, sellers of stock so certified who hold for their own premises valid certificates from this office are hereby authorized to substitute the certificate of this office for certificates of inspectors of other States as named below:

Alabama—F. S. Earle.
California—Alexander Craw.
Colorado—C. P. Gillette.
Connecticut—W. E. Britton.
Delaware—Wesley Webb.
Florida—P. H. Rolfs, A. L. Quaintance.
Georgia—W. N. Scott.
Illinois—S. A. Forbes.
Iowa—H. E. Summers.
Kansas—Percy J. Parrott, E. A. Popenoe, J. S. Hunter.
Kentucky—H. Garman.
Maryland—W. G. Johnson, C. O. Townsend.
Massachusetts—C. H. Fernald, H. T. Fernald.
Michigan—D. W. Trine.
Montana—I. D. O'Donnell, Robert A. Cooley, C. H. Campbell, W. H. Harlan, J. H. Edwards.

Digitized by Google

Nebraska—Lawrence Bruner.

New Jersey—John B. Smith.

New York—C. A. Wieting.

North Carolina—Gerald McCarthy.

Ohio—F. M. Webster.

Oregon—Wilbur K. Newell, Lloyd T. Reynolds, J. R. Casey, Emile Schanno, Judd Geer.

Pennsylvania—S. B. Heiges, Frank M. Bartram, Geo. C. Butz.

Tennessee—Chas. E. Chambliss.

Utah—J. A. Wright, J. P. Sorensen, C. A. Hickenlooper.

Vermont—F. A. Waugh.

Virginia—William B. Alwood, J. L. Phillips.

Washington—J. E. Baker.

Wisconsin—W. A. Henry, E. S. Goff.

In case of misuse of certificate by changing, defacing or placing it on uninspected stock, the undersigned reserves the right to revoke any such certificate and to refuse thereafter to inspect the premises of the person or firm so doing.

JAMES TROOP,
State Entomologist.

NURSERIES INSPECTED DURING THE PAST YEAR.

The work of inspection for the year 1900 began June 1 with the same assistants as were employed in 1899, viz.: H. H. Swaim, of South Bend, and R. A. Simpson, of Vincennes, both of whom proved themselves to be well qualified for the duties assigned them. In July Mr. Simpson resigned and his brother, H. D. Simpson, was appointed in his place. Mr. H. M. Widney of Dekalb County was also appointed especially to look after the canker worm and black knot in that section of the State.

In September an outbreak of the San Jose scale was reported in some of the Ohio River counties, and as my regular assistants were employed elsewhere, I appointed Mr. C. E. Craig of Otwell, Pike County, a former student of mine, to make an investigation, which he did in a very satisfactory manner.

For the purpose of convenience in making the inspection, the State was divided into three districts—the northern, central and southern—to each of which was assigned an inspector, including myself. In this manner we were able to accomplish the task in

Digitized by Google

the required time. One hundred and sixty-one nurseries were inspected, in only two of which was found the San Jose scale, and these had evidently come from infested orchards near by. The infested trees in these nurseries were dug up and burned, and the owners were ordered to fumigate all trees sold with hydro-cyanic acid gas, which would destroy any living scale insect which might have been overlooked in the burning. This work in one of the nurseries was done under the immediate supervision of one of my assistants, and the owner was required to sign the following statement before a certificate was granted him:

I, ..., do hereby agree and affirm that I will not sell or permit to be sold, before June 1, 1901, any nursery stock which has been grown on my premises, except that which has been fumigated under the direct supervision of the Assistant State Entomologist on or before October 23, 1900. It is further expressly understood that it is upon the above condition that I receive the State Entomologist's certificate of inspection, which expires June 1, 1901.

It was our opinion that after this thorough and heroic treatment there could be no possible danger resulting from the spread of the insect.

INFESTED ORCHARDS.

In 1899 I reported the San Jose scale as having been found in thirteen counties. During the past year, four more counties have been added to the list of those in which the scale has been found. The list now includes Laporte, Lagrange, Dekalb, Miami, Howard, Wayne, Morgan, Marion, Vigo, Jefferson, Clay, Vanderburgh, Perry, Clark, Washington, Franklin and Gibson. The outbreaks in Laporte, Lagrange, Dekalb, Howard, Morgan and Franklin counties, however, were of a mild nature, and by applying thorough treatment to the trees, I am quite confident that these counties have been nearly or entirely freed from the scale. Further investigation, however, may show this to be a false conclusion. Last year it was thought that Marion County could be placed in the exemption list, but during the past summer trees in nearly twenty different city lots in the city of Indianapolis have been found to be seriously infested. Here seems to be a serious problem for the city authorities to solve, as the present appropriation for the use of the

Digitized by Google

State Entomologist will not warrant him in undertaking the job alone, although much has already been done by destroying badly infested trees and giving advice as to how to treat the remainder.

Another seriously infested locality is the city of Evansville and the county immediately surrounding it. One of my assistants, Mr. C. E. Craig, was sent down to make investigations, and after spending about three weeks in that vicinity, he reported fifty-six different places more or less infested with the scale. Many trees were ordered destroyed and the proper remedy given for the balance, but to be successful in combating this pest in these badly infested districts will necessitate the employment of a competent man to give his entire time to the work for several months during the year, in addition to the regular nursery inspection work.

During the year there have been visited one hundred and thirty orchards, including the city lots mentioned above. These, with the 161 nurseries inspected, make a total of two hundred and ninety-one inspections for the year. The total cost of these inspections was $711.37, or $2.44 for each inspection. Perhaps a word of explanation is needed here. The last General Assembly appropriated $1,000 annually for the expenses of this office, but according to a ruling of the Auditor of State, only $583.31 of this amount was available for the first year. The expenses of the first year exceeded this amount $288.63, which left for the present year only $711.37, which amount was entirely exhausted before the work of the year which should have been done was completed. The State Entomologist of Illinois, in his report of the cost of similar inspection work done in that State during the past two years, states that he received $9,292.25, and paid out $9,080.05, or more than $4,500 per year.

This expense was divided as follows:

Inspection of orchards	$1,253 85
Inspection of nurseries	2,601 14
For destruction of San Jose scale	5,225 06

It will be seen that the cost of eradicating the scale, where it had already gained access to the orchards, was more than one-half the entire cost of inspection.

Digitized by Google

The fruit interests of Indiana are perhaps not so great as those of Illinois, but with the proper encouragement there is no reason why they should not become so. We may never be able to entirely eradicate the San Jose scale from all of our orchards, but I am confident that. with an increase of $1,000 in the annual appropriations for this work, we shall be able to largely check its further spread. I am glad to be able to state that the sentiment which exists among the fruit growers, in localities where the scale has been found, is very encouraging, and, with but few exceptions, the men who have been commissioned to execute the inspection law have been treated with the utmost courtesy, and have been given every opportunity by the owners of nurseries and orchards to perform their work thoroughly. There is no question but that the law is a good one, and that much good is resulting to the fruit interests of the State.

FINANCIAL STATEMENT FOR THE YEAR ENDING OCT. 31, 1900.

Receipts.

Amount received from State treasury	$1,000 00

Expenditures.

Excess of expenditures for 1899	$288 63	
Traveling expenses, including hotel bills and livery hire	317 97	
Postage, express, telegrams	19 30	
Per diem of self and assistants	361 25	
Stationery and printing	12 85	
Total expenditures		$1,000 00

Respectfully submitted,

JAMES TROOP,
State Entomologist.

LIST OF INDIANA NURSERYMEN, INSPECTED IN 1900.

With name and postoffice address, together with amount of stock under cultivation.

BY J. TROOP, STATE ENTOMOLOGIST.

Albertson & Hobbs, Bridgeport, Marion County. Location, one-half mile west of Bridgeport. Two hundred acres in nursery stock.

H. W. Henry, Laporte, Laporte County. Location, one mile northwest of Laporte. Seventeen acres of small fruits and three acres of fruit and ornamental trees.

Digitized by Google

Wm. La Hane, Chesterton, Porter County. Location, suburbs of the town. Five acres small fruits. Dealer.

W. H. H. Smith, Medaryville, Pulaski County. Dealer.

S. W. Kepler, Pulaski, Pulaski County. Location, five miles southwest of Pulaski. Two and one-half acres each of small fruits and tree fruits.

W. B. Warfield, Pulaski, Pulaski County. Location, six miles southwest of Pulaski. One acre small fruits. Dealer.

Joseph Korner, Star City, Pulaski County. Location, two and one-half miles west of town. Four acres small fruits. Dealer.

A. C. McKinley, Francesville, Pulaski County. Location, western part of village. Dealer.

Chas. Scott, Winamac, Pulaski County. Location, one and one-half miles southeast of village. One acre tree fruits and ornamentals.

L. J. Noe, Winamac, Pulaski County. Location, one and one-half miles northwest of town. Eleven acres small fruits. Dealer.

Hugh Rogers, Knox, Starke County. Location, one mile south. Fourteen acres small fruits. Dealer.

H. M. Hand, Argos, Marshall County. Location, three miles northwest. Three acres small fruits.

T. J. Coffeen, South Bend, St. Joseph County. Location, three miles southeast. Twenty-one acres small fruits. Dealer.

C. P. Bradley, South Bend, St. Joseph County. Location, three and one-half miles southeast. Twelve acres small fruits. Dealer.

A. Y. Cathcart, Bristol, Elkhart County. Location, near town. Ten acres small fruits. Dealer.

J. C. Grossman, Wolcottville, Lagrange County. Location, three miles northwest. Two acres small fruits. Dealer.

John W. Holmes, Wallen, Allen County. Location, five miles southeast of Huntertown, four miles northwest of Wallen. Two acres apples and pears. Dealer.

C. M. Parks, Bourbon, Marshall County. Location, one-half mile south. Two acres apples and pears, ten acres small fruits. Dealer.

Holland & Co., Plymouth, Marshall County. Location, two and one-half miles southwest. Eleven acres trees, one acre small fruits.

Jesse Wickinger, Plymouth, Marshall County. Location, two miles south. Eight acres small fruits. Dealer.

J. F. Melton, Amboy, Miami County. Location, in town. Two acres small fruits. Dealer.

Henry Minnick, Converse, Miami County. Location, three and one-half miles northeast. Two and one-half acres apples, cherries and pears.

John N. Trook, Converse, Miami County. Location, in town. Dealer and jobber.

Digitized by Google

A. C. Preble, Marion, Grant County. Location, 212 South Adams Street. One acre in nursery stock. Dealer.

F. M. Grant, La Fountain, Wabash County. Location, east side of town. One acre nursery stock. Dealer.

W. W. Poole, Wabash, Wabash County. Location, six miles north of Wabash. Two acres of stock.

B. Cook, Ijamsville, Wabash County. Location, one-half mile west. One acre small fruits. Dealer.

G. N. Moyer, Laketon, Wabash County. Location, eastern part of village. Forty acres trees and small fruits.

D. M. Garber, North Webster, Kosciusko County. Location, two miles south. Twenty-four acres small fruits. Dealer.

Hurrow & Everetts, Butler, Dekalb County. Location, six and one-half miles north. Eight acres, mostly small fruits. Dealer.

B. F. Mason, Red Key, Jay County. Location, in town. Fifteen acres small fruits and ten acres tree fruits two miles from town. Also ten acres of stock near Martinsville, Ind.

J. B. Witwer, South Bend, St. Joseph County. Location, one mile east. One acre tree fruits and ornamentals.

J. W. Snoke, South Bend, St. Joseph County. Location, in town. Dealer.

Peter Kongen, South Bend, St. Joseph County. Location, four miles southwest. Dealer.

Bremen Nursery Company, Bremen, Marshall County. Location, just outside of town. Eight acres fruit, shade and ornamentals and four acres small fruits.

Jonas Stineman, Wawpecung, Miami County. Location, six miles east of Bennetts. Dealer.

John I. Williams, Warren, Huntington County. Location, north side of town. Two acres fruit trees.

G. W. Williams, Hartford City, Blackford County. Location of nursery, four and one-half miles south of Warren. Two acres fruit trees.

T. J. Mercer, Dillman, Wells County. Location, seven miles south of Warren. Two acres of nursery stock.

Wabash Valley Nursery Company (J. B. Evans), Bluffton, Wells County. Location, adjoining the town on west. Fifteen acres fruit trees.

Geo. Harnish, Bluffton, Wells County. Location of nursery, five miles northwest. Resides in town. Three acres tree fruits and 65 acres in orchard all under five years.

J. B. Alexander, Hartford City, Blackford County. Location, southwest part of city. Dealer.

Geo. J. Hoagland, Portland, Jay County. Location. five miles north of Red Key. Seven acres small fruits. Dealer.

Digitized by Google

E. Potter, Red Key, Jay County. Location, five and one-half miles north. Two acres small fruits.

John Caylor, Ridgeville, Randolph County. Location, eastern limits of city. Eight acres tree fruits and shade trees.

J. M. T. Wright Nursery Company, Portland, Jay County. Resides one mile west. Ten acres fruits and shade trees. Four acres small fruits.

Warren C. Gregg, Pennville, Jay County. Location, one mile northwest. Eight acres trees and four acres small fruits.

Geo. Paxson & Son, Pennville, Jay County. Location, three miles northwest. Two acres tree fruits, one-half acre small fruits.

Jarrett & West, Montpelier, Blackford County. Location, two and one-half miles west. Six acres fruit and shade.

T. J. Peffley, Dora, Wabash County. Twenty acres small fruits and sixty acres in orchard.

Harry White, New Holland, Wabash County. Location, ten miles southeast of Wabash. Eight acres small fruits; florist and dealer.

H. H. Swaim, South Bend, St. Joseph County. Location, three miles southwest. Six acres small fruits.

Willard Fullhart & Co., Muncie, Delaware County. Location, four and one-half miles southeast. Eight acres in tree and four acres in small fruits.

S. Hughel & Son, Anderson, Madison County, Location, one mile east. Seven acres in trees and five acres small fruits.

M. L. Tuttle, Anderson, Madison County. Location of nursery, four miles north of La Pel. One acre.

Wm. S. Wade, Perkinsville, Madison County. Location, four miles north of La Pel. One acre.

The La Pel Nursery Company, La Pel, Madison County. Location of nursery, two miles north. Five acres trees, two acres small fruits.

W. W. Phelps, Noblesville, Hamilton County. Location, two miles southeast. Two acres trees, ten acres small fruits.

Chas. Wasson, Westfield, Hamilton County. Location, two miles east. One and one-half acres Carolina poplars, one acre small fruits.

Mrs. Jane Sanders & Son, Westfield, Hamilton County. Location, one mile east. Two acres in trees.

Carmel Nurseries (W. J. Ward), Carmel, Hamilton County. Residence, Carmel, nursery, two and one-half miles south. Five acres small fruits. Dealer.

H. C. Weaver & Co., Shelbyville, Shelby County. Location, one and one-half miles southeast. Five acres trees, two acres small fruits.

L. B. Cochran, Greensburg, Decatur County. Location, north side of town. Five acres trees, one and one-half acres small fruits.

Digitized by Google

Geo. C. Young, Greensburg, Decatur County. Location, one mile southeast. One acre nursery, and one acre small fruits.

Samuel Kelly, Alert, Decatur County. Location, north end of town. One acre.

David M. Goss, Goss' Mills, Jackson County. Location, six miles south of Freetown. One acre.

G. W. True, Lockman, Brown County. Location, seven miles north of Freetown. One acre.

Samson David, Nashville, Brown County. Location, seven miles north of Freetown. One acre.

The Fidelity Nursery (Phillips Brothers), Hobbieville, Greene County. Fourteen miles west of Bloomfield. Ten acres in tree fruits.

Thos. J. Ward, St. Marys, Vigo County. Location, two and one-half miles northeast of St. Marys and six miles northwest of Terre Haute. Ten acres of nursery and twenty-five in orchard.

Decatur Downing, Clinton, Vermillion County. Location of nursery, three miles northwest. Ten acres in nursery, eighty acres in orchard.

Amos Ragle, Elnora, Daviess County. Location, south side of Elnora. Seven acres trees, four acres small fruits.

H. R. Merrill, Brownstown, Jackson County. Location of nursery, a part two miles east of Freetown and a part northeast of Brownstown.

Frank Milhouse & Son, Hyde, Jennings County. Location, five miles southeast of Butlerville and one and one-half miles east of Hyde. Twelve acres trees.

Henry C. Semon, Bennville, Jennings County. Location, one and one-half miles east in Ripley County.

Jesse G. Milhouse, Ezra, Jennings County. Location, four and one-half miles southeast of Butlerville. Three acres.

Ben Knaub, North Vernon, Jennings County. Five and one-half miles northeast. One acre.

C. C. Pennington, North Vernon, Jennings County. Location, south side of town. One acre nursery and small fruits.

L. D. Pennington, Vernon, Jennings County. Location, one and one-half miles southwest. Two acres.

Thos. H. Beavers, New Castle, Henry County. Location, three miles north. Four acres nursery stock and small fruits.

W. E. Stacey, Lyons, Greene County. Location nursery, two miles north. Two acres nursery, one of small fruits.

H. A. Burkhart & Son, Indianapolis, Marion County. Location, three miles south. Three acres nursery and fifteen acres small fruits.

E. G. Hill & Co., florists, Richmond, Wayne County. Location, one-half mile east. Two acres in plants and twenty greenhouses.

Digitized by Google

E. Y. Teas, Green Forks, Wayne County. Location, three miles northeast. One and one-half acres, mostly bulbs.

W. H. Gaar, East Germantown, Wayne County. Location, residence in town, nursery one and one-half miles southeast. Two acres in nursery and three in small fruits.

Thos. B. Morris, Richmond, Wayne County. Location, one mile east. Four acres nursery and one-half acre small fruits.

Mercer Browne, Spiceland, Henry County. Location, one mile south of Spiceland and one and one-half miles north of Dunreith. Ten acres in nursery and five in small fruits.

Charles A. Merrick, Cambridge City, Wayne County. Location, northeast side of town. Small fruits only.

John Bird & Son, Raysville, Henry County. Location, north side of town railroad station, Knightstown. Ten acres nursery.

W. P. Bundy, Dunreith, Henry County. Location, one-fourth mile north. Eighteen acres nursery, two acres small fruits.

W. H. Shields, Charlottesville, Hancock County. Location, north side of town. Two acres nursery, two acres small fruits.

B. F. Stinger, Charlottesville, Hancock County. Location, residence in town; two acres small fruits one and one-half miles north. Strawberry plants only.

D. H. Goble, Greenfield, Hancock County. Location, one and one-fourth miles west on National pike. Fifteen acres in small fruits, currants and berry plants.

J. E. Shideler, Indianapolis, Marion County. Location, 550 West Forty-second Street. Seven acres small fruits.

Ed. A. Eickhoff, Gallaudet, Marion County. Location, six miles southeast of Indianapolis. Two acres in nursery, five acres small fruits.

H. C. Eickhoff, Gallaudet, Marion County. Location, four miles southeast of Indianapolis. Four acres nursery, three acres small fruits.

J. K. Henby & Son, Greenfield, Hancock County. Location, one mile west. Thirty acres in ursery, fifteen acres small fruits.

Hiram P. Dean, Marble Hill, Jefferson County. Location, adjoining town. Six acres in nursery.

Reed Nursery Company, Harrell, Jefferson County. Location, two and one-half miles southeast of Harrell. Four acres of nursery.

Chas. F. Graham, New Albany, Floyd County. Location, two and one-half miles northeast of city. Three acres in nursery.

F. Walker & Co., New Albany, Floyd County. Location, two miles northeast. Five acres in nursery.

Mrs. Elizabeth Vernia, New Albany, Floyd County. Location, three miles southwest of city. Four acres in nursery.

Digitized by Google

J. K. Graham, New Albany, Floyd County. Location, lives in the city; nursery three miles north. Two acres in nursery.

John J. Deitrich, Henzie, Clark County. Location, six miles northeast of Borden. One-fourth acre in nursery.

Wm. N. Fordyce, Borden, Clark County. Location, two miles south of Borden. One acre in nursery.

O. P. Fordyce, Salem, Washington County. Location, one-fourth mile south of town. Two acres in nursery.

Jas. W. Heacock, Canton, Washington County. Location, one-fourth mile north of Canton. One-half acre in nursery.

E. E. Heacock, Salem, Washington County. Location, four miles northwest of town. One-half acre in trees.

H. G. Currey, Mitchell, Lawrence County. Location, resides in town; nursery five miles south. Two acres in trees.

W. T. Terrell, Bloomfield, Greene County. Location, one-half mile north of town. Fifteen acres in trees and two acres small fruits.

J. M. Bridges, Dugger, Greene County. Location, one mile east and two miles south of Bloomfield. Twelve acres in nursery.

R. T. Patterson, Bloomfield, Greene County. Location, one mile south of town. Two acres in trees and three acres in small fruits.

C. E. Dixon, Bloomfield, Greene County. Location, one mile south of town. Six acres orchard and three acres small fruits.

John Lucas, Bloomfield, Greene County. Location, four miles east of town. Two acres trees, one acre raspberries.

Sig. Rogers, Bloomfield, Greene County. Location, two miles northwest of town. Two acres small fruits.

W. C. Bennett, Scotland, Greene County. Location, four miles south of Koleen. Seventy acres in trees, two acres in small fruits.

W. E. King, Scotland, Greene County. Location, five miles south of Koleen. Three acres nursery stock.

Dickey & Garrett, Doans, Greene County. Location, near town. Six acres in nursery stock.

Martindale & Hostetter, Doans, Greene County. Location, near town. Eleven acres in nursery stock.

S. D. Bennett, Koleen, Greene County. Location, two and one-half miles southwest. One acre nursery and one acre small fruits.

Meredith & Son, Koleen, Greene County. Location, two and one-half miles southeast. Eighteen acres in nursery stock; one acre small fruits.

W. C. Reed, Vincennes, Knox County. Location four miles southeast. Fifty acres nursery stock; twenty-five acres small fruits.

H. M. Simpson & Sons, Vincennes, Knox County. Location, two miles east. Fifty acres in nursery stock, twenty-five acres small fruits.

Digitized by Google

W. M. Cockrum, Oakland City, Gibson County. Location, near town. One and three-fourths acres nursery stock.

W. D. Bowen, Evansvillie, Vanderburgh County. Location, one and three-fourth miles southeast. Seven acres in nursery stock.

L. Crosby, Washington, Daviess County. Location two miles southeast.

W. E. McElldery, Booneville, Warrick County. Location, in town and one-half mile south. Five acres in nursery.

Peter Broshears, Booneville, Warrick County. Location, one-half mile south. Small stock.

E. T. Jeffries, Booneville, Warrick County. Location, five miles southwest. Small stock.

John Heins, Jr., & Co., Lake, Spencer County. Location, two miles south. Three acres in stock.

A. L. Hein, Chandler, Warrick County. Location, five miles west. Ten acres in nursery stock.

Smith Hazen, Hatfield, Spencer County. Location, one mile south. Five acres in nursery stock.

W. T. Smith, Grand View, Spencer County. Location, near town. Six miles from Rockport. Five acres.

W. R. Polk, Tobinsport, Perry County. Location, one-half mile west. Ten acres in nursery.

G. W. Winchel, Tobinsport, Perry County. Location, west of W. R. Polk. Small stock.

John S. Burgess, Depauw, Harrison County. Location, three miles south. Ten acres.

Peter W. Wolfe, Moberly, Harrison County. Location, one and three-fourth miles southeast. Three acres.

Charles McClaren, Sunshine, Harrison County. Location, one-fourth mile southwest. Three acres.

J. M. Alstott & Son, Sunshine, Harrison County. Location, one and one-half mile southeast. Four acres.

Geo. W. McIntosh, Rego, Orange County. Location one-half mile southwest. Five acres.

Montgomery & Ervin, Scottsburg, Scott County. Location, four miles southeast of Scottsburg. Five acres.

H. D. Brubaker, Ridgeway, Howard County. Location, one and one-half miles from town. Small fruits and small stock of trees.

James Ford, Princeton, Gibson County. Location, in city limits. Small stock.

J. O. Ward, Huntington, Huntington County. Location, edge of city. Two acres of trees.

F. B. LeSourd, Sleeth, Carroll County. Location, near town. Small fruits. Dealer.

Digitized by Google

C. B. Moore, Sitka, White County. Location, five miles northeast of Monticello. Five acres small fruits.

Wilber C. Stout, Monrovia, Morgan County. Location, six miles from town.

Granville Cowing, Muncie, Delaware County. Location, three miles north. Small fruits.

Lee Ripperdan, Valley City, Harrison County. Location, near town. Small stock.

O. Engles, Wolton, Cass County. Location, near town. Small fruits. Dealer.

T. F. Craig, Otwell, Pike County. Location, near Velpen. Small stock.

Walter Brown, Connersville, Fayette County. Location, near town. One-half acre catalpas.

Randolph Bros., Lafayette, Tippecanoe County. Location, three miles southeast. Thirty acres.

A. S. Bennett, Lafayette, Tippecanoe County. Location, near city limits, southeast. Ten acres.

O. A. J. Morrison, Middlefork, Clinton County. Location, six miles south of Michigantown. Carolina poplars.

Snoddy Nursery Co., Lafayette, Tippecanoe County. Location, one mile west. Five acres. Dealers.

J. F. Dreyer, Frankfort, Clinton County. Location, in suburbs. Two acres, mostly small fruits.

Ran Beuoy, Matthews, Grant County. Location, one mile west. One acre small fruits.

J. M. Wilson, North Judson, Starke County. Location, near town. Small fruits.

REPORT OF DELEGATE TO MISSOURI HORTICULTURAL SOCIETY.

BY W. C. REED, VINCENNES, IND.

We left St. Louis December 3d, over the St. Louis, Iron Mountain & Southern Railroad, following the Mississippi River for quite a distance. After leaving the river, the road begins to ascend the Ozarks. Judging from appearances and what we could see from the train, the country is very sparsely settled. In fact the land is too rough and rocky for cultivation. It is mostly covered with a second growth of white oak, red cedar and scrub oak, with some very large sycamore and elm along the streams in the valleys.

There seems to be some good land along the creek bottoms, but only in small patches.

Digitized by Google

This same kind of scenery continues until we reach Bismarck, seventy-five miles south of St. Louis. Here we changed cars and took the Belmont branch for Dellassus, twelve miles distant. Arriving at Dellassus, we were met by hackmen, who drove us two and one-half miles to Farmington, the county seat of St. Francis County.

Imagine our surprise on arriving at Farmington to find nice rolling land, mostly in cultivation, and land that grows crops equal to most of our Indiana farms. This land, I am told, is worth $100 per acre, the mineral underneath being the reason the land is so valuable, as this is the greatest lead and zinc producing county in Missouri.

Farmington is a very thrifty town of 3,000 inhabitants, good buildings and a great many new houses in course of construction.

On reaching Farmington we went direct to the opera house, where the Missouri Horticultural Society was in session.

Here we found quite a good attendance for the morning session. The opera house was artistically decorated with bunting, flags and flowers. Also a display of all the mineral products of the county, which attracted considerable attention. And last, but not least, the fruit display, which was very large, principally of apples. The specimens were very fair, but some showed the effects of that dreaded scourge, the bitter rot.

The assortment of varieties was not as large as we usually have at our own State meetings. Ben Davis, Gano, Jonathan, Huntsman, York Imperial and Ingram being the leaders. Grimes' Golden and Winesap are grown some, but are recommended only for strong land, and principally on the lower ground or bottom lands.

The pear seems to be neglected somewhat, although I was told pears do exceedingly well around Farmington, having been planted there by the early French settlers. The soil is a red clay, with plenty of iron—just what the pear needs.

Mr. A. T. Nelson's paper on "Packing and Marketing," was very instructive. Mr. Nelson and son have had large experience in this line, having packed seventeen thousand barrels of apples this fall, fifteen thousand of which are now in cold storage. He urges fruit growers to pack their fruit honestly, nothing but strictly first-class stock, and put in cold storage for the late market. It will always pay.

The night meetings were devoted mostly to literary and music, by home talent, of which there seems to be a good supply, as there are two colleges and one ladies' seminary there.

Dr. Wm. Trelease, of Missouri Botanical Garden, St. Louis, gave a very instructive lecture on "Edible and Poisonous Mushrooms and Toad-Stools," with lantern illustrations. Thursday morning the Pan-American exhibit came up for discussion. Their arrangements are mostly com-

Digitized by Google

pleted, having 200 barrels of select apples in cold storage, and space secured, the society not yet having received an appropriation to carry out the work. Mr. Nelson, their treasurer, who is also a commissioner to the Pan-American, has spent $1,000 of his own money making preparations for the exhibit, trusting that the State will repay him. Indiana needs some of this push and enterprise or we will fall behind. They are also making arrangements for St. Louis in 1903.

Professor Stinson's paper on "Spraying," gave the results of experiments to control the bitter rot. In a plat that was not sprayed they picked two bushels of good apples and one hundred and forty bushels affected with bitter rot and entirely worthless. Plots sprayed two, three and four times showed benefits in proportion to the number of sprayings. The best results, however, were from five applications. The plot gave 99½ bushels of good apples and 67½ bushels of affected fruit. This was salable, however, and brought enough to pay all expenses of the five sprayings. Huntsman, which seems to suffer worse than some other varieties, where sprayed five times, gave 80 per cent. of first-class fruit; where not sprayed, 20 per cent. first-class. He used the Bordeaux mixture of ordinary strength and made the last spraying about August 1st. The fruit showed no bad effects from the late spraying. The dust sprayers seemed to attract considerable attention, and were well spoken of by several who had tested them, as they can be used at times when it would be impossible to get in the orchard with a liquid spray, when the ground is soft.

Professor Steadman's lecture, with lantern illustration, of "An Entomological Trip Through Old Mexico," was very instructive and interesting.

Professor Van Schrenk, of the Missouri Botanical Gardens, gave his experience with experiments in root rot, showing several specimens of trees that had died with the same. The specmens showed the growth of the fungus very plain. Apple trees planted where others had died with the disease invariably succumb to its ravages in a short time, but pear planted in the same holes were not affected. The root rot is doing great damage in southwestern Missouri, in some cases having destroyed an entire forty-acre orchard. For further information he referred us to Bulletin No. 33 of the Arizona Experiment Station, where it has been thoroughly tested.

Mr. G. P. Turner read a paper on "Pruning and Planting" that brought out considerable discussion. I find that the most successful orchards are those that were planted shallow. In fact, some were planted on top of the ground and dirt banked up to them. These orchards have given the

Digitized by Google

very best of results. This method I think would be worth trying, at least, especially in low ground, as it would give better drainage.

W. R. Wilkerson gave his experience with cropping an orchard, his principal crop being hogs, and then growing a succession of forage crops for them. He has quite a large orchard and divides it into smaller fields, sowing an early variety of barley, then cow peas, early and late, these being pastured off as fast as they are ready. He also uses red clover, but never leaves more than one season, as he believes in cultivating as often as possible, not so much early, but later in the season, to mature the fruit crop and hold the foliage late. Spraying does not seem to have the attention it deserves. In Missouri the majority of the orchards are compartively young and the country new as compared with some of the older States. They have not been bothered with scab and codling moth as much as we have. However, with bitter rot and other diseases increasing, the up-to-date fruit grower will be compelled to spray to keep the balance on the right side of the ledger.

The meeting adjourned at 10 p. m., December 5th, and we left at 2:30 a. m. for St. Louis, although some twenty-five or thirty stayed over to take a trip out to the mines the next morning. Arriving in St. Louis at 7:30 a. m., we started for home.

Digitized by Google

REPORTS OF COUNTY HORTICULTURAL SOCIETIES.

REPORT OF LAGRANGE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

To Indiana Horticultural Society:

It is with much pleasure that the Lagrange County Agricultural and Horticultural Society sends its first annual greeting.

On December 30, 1899, in response to a call made by J. C. Grossman, a half dozen persons met at the courthouse in Lagrange and effected a partial organization by electing J. C. Grossman president; Mrs. Lizzie Royer, secretary, and Charles Lowth, treasurer. Nine persons subscribed their names to the membership roll and J. C. Grossman was appointed delegate to the annual meeting and to the State Board of Agriculture.

March 14, 1900, another meeting was held in the courthouse and a program carried out, after which a complete organization was effected, with the following persons as officers: President, J. C. Grossman, Wolcottville; Vice-President, J. J. Davidson, Lima; Secretary, Mrs. Lizzie Royer, Valentine; Executive Committee, Benjamin Ruhl, Lima, Mrs. J. W. Miller, Lagrange, John Green, Valentine.

Meetings were held May 5, June 20, August 15 and October 2, all with increased interest.

August 23 some twenty-five of the members, in company with a large number of the Noble County Society members, with the addition of President Hobbs and Secretary Troop, went on an excursion to Benton Harbor and visited Mr. R. Morrill's famous peach orchard. This proved the best object lesson that we had ever experienced and the benefits will be lasting.

Saturday, December 15, the first annual meeting of the Society was held at the pleasant farm home of Mr. and Mrs. J. W. Mills. Over sixty enthusiastic and happy people attended this meeting, and partook of the bountiful repast furnished by the ladies. Several good papers were read and ably discussed.

The Society at the close of the year had a membership of forty-nine, with twenty members in the State Society. The following officers were elected for the ensuing year: President, J. C. Grossman, Wolcottville; Vice-President, J. W. Mills, Lagrange; Secretary, Mrs. Lizzie Royer, Valentine; Treasurer, Chas. Lowth, Lagrange; Executive Committee, J. J. Gillette, Lagrange, R. H. Newman, Lagrange, A. J. Sigley, Woodruff; Program Committee, Riley C. Case, Lagrange, Mrs. J. W. Mills, Lagrange, Mrs. R. H. Newman, Lagrange, J. J. Gillette; Delegate to State Board of Agriculture, J. C. Grossman.

Digitized by Google

REPORT OF NOBLE COUNTY HORTICULTURAL SOCIETY.

Prof. James Troop, Secretary Indiana Horticultural Society:

Dear Sir—The Noble County Horticultural Society during the past year, beginning December, 1899, and ending December, 1900, enrolled on its list forty-six paid members; total number of members, 100. It held six regular meetings during the year. One of these was held at Albion, one at Rome City and four at the homes of members. Two called meetings of officers and working members were held.

It has sent delegates to State Horticultural meetings at Indianapolis and Plainfield. Also delegate to State Board of Agriculture meeting at Indianapolis, and gave its members an outing, going to the famous peach farm of Mr. Morrill, near Benton Harbor, Michigan.

The following officers were elected at the December meeting for the year 1901: J. C. Kimmell, President; Levi W. Harvey, Vice-President; J. W. Moorhouse, Secretary; George Feebles, Treasurer; Executive Committee, Don K. Hitchcock, Rev. Wm. Talbert, W. W. Carey.

Receipts.

1899, December—	
Cash balance on hand	$78 77
1900—	
On account of dues	23 00
For advertising	80 00
Premiums, State Fair	23 00
Miscellaneous	4 76
Total	$209 53

Expenditures.

1900—	
Delegate State Horticultural meeting	$10 00
Delegate State Agricultural meeting	10 00
Printing premium list	76 50
Other printing	6 25
Committee State Fair exhibit	33 76
Wagon hire at Benton Harbor	40 00
Premiums	22 30
Miscellaneous	9 28
Total	$208 09
Balance on hand	$1 44

Digitized by Google

A full report of proceedings will be published in Society premium list for 1901 and a copy mailed you as soon as published.

The apple crop was light. Late apples were mostly blown off during the great wind storm.

Only a few varieties of pears bore fruit. Peaches, cherries and plums were a failure. Small fruits a good yield.

This Society has during the past year perfected plans for a co-operative apple orchard within the county, and will make the sale of trees and planting of apple orchards its leading work during the coming year.

JOHN W. MOORHOUSE,
Secretary.

REPORT OF MADISON COUNTY HORTICULTURAL SOCIETY.

To Prof. James Troop, Secretary Indiana Horticultural Society:

Dear Sir—Since your last report contained no mention of the Madison County Horticultural Society, or the work it is doing, we beg leave to say that we are not only alive, but in a flourishing condition.

Meetings are held on the third Wednesday of each month. All are well attended, there seldom being fewer than fifty persons present in the worst weather, and in the summer time the attendance reaches three and four times that many.

We are a Horticultural Society in name, yet, this section having large live stock and agricultural interests, papers on these subjects have been found both interesting and profitable. Papers on social and economic questions have sometimes been found very instructive. Our motto might be "The greatest good to the greatest number." Although the members of the Society are nearly all horticulturists, agriculturists or stock men, we scarcely ever hold a meeting at which there are not professional and business men and their families with us.

They seem to find that which interests them in our meetings, and we enjoy having them with us. In this way the old barrier that was supposed to exist between the city bred man and his country cousin has here been destroyed and forgotten. Our Society is often entertained in the best homes in our county seat.

Perhaps no one subject that has come before the Society during the year has elicited more interest or, so far, been more instructive than a series of four papers (two of which have been delivered) on "Forestry," by Joshua Tussell, of Markleville.

Yours truly,
W. CLIFFORD WOOD,
Chairman.

Digitized by Google

REPORT OF THE MONROE COUNTY HORTICULTURAL AND AGRICULTURAL SOCIETY.

Our Society has had a very pleasant and profitable year, although none of our members have had a bountiful fruit harvest. Strawberries and raspberries were about half a crop; blackberries were almost an entire failure; cherries were a full crop; plums half crop. There were but few peaches, and they were of inferior quality. Grapes rotted badly and were not more than half a crop.

There were but few orchards that had anything like a full crop of apples, and a great many of them were only fit for hog feed. The fall and early winter apples are about all gone, and what are usually late keepers are going very fast.

Apples were badly stung by the curculio, and spraying seemed to have little effect.

We hold our meetings the second Wednesday of every month, except January and February. Our annual meeting for the reports and election of officers is in March.

The officers the past year were Ben Kirby, President; J. T. Eller, Vice-President; Geo. P. Campbell, Secretary; J. S. Dinsmore, Treasurer; Fred Fess, R. H. Chamberlain and A. G. Howe, Trustees.

We held a fair on the day of our September meeting, competition being limited to the members. The display was very good, considering our poor fruit crop. Premiums were offered on all farm and garden crops, as well as table luxuries.

We also hold our annual strawberry show at our June meeting.

We have twenty-five active members and about $80 in the treasury.

REPORT OF ST. JOSEPH COUNTY HORTICULTURAL SOCIETY.

Prof. James Troop, Secretary State Horticultural Society:

Dear Sir—The St. Joseph County Horticultural Society has enjoyed a very pleasant and profitable year. We offer premiums on fruit exhibited at our meetings from April to November, inclusive. Our receipts for the year show a gain of $21.07 over 1899.

We have a membership of about eighty, and expect to aid the fruit growers of Laporte County during the meeting next summer.

The following are the officers for the year 1901: President, Geo. F. Newton; Vice-President, J. W. Kring; Secretary, H. W. Newman; Treasurer, C. P. Bradley; Program Officer, Mrs. B. A. Caldwell, all of South Bend.

Respectfully,

H. W. NEWMAN,

Secretary St. Joseph County Horticultural Society.

Digitized by Google

REPORT OF THE WAYNE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY OF RICHMOND, IND.

To the Indiana Horticultural Society:

In submitting this my annual report of the Wayne County Agricultural and Horticultural Society for your consideration, we can not but be zealous in stating that this Society has been in continued existence about the longest, and is one of the oldest organizations of its kind in the State, and that it furnished its share of charter members to the State Society.

Our Society holds twelve sessions annually, either in the Society's room at the county courthouse or by invitation at the residences of some of our members and friends. Those held during the summer months are of this class, and are usually all-day gatherings. Well-filled baskets are taken, and at the noon hour a sumptuous picnic dinner is spread, where the ladies pleasingly vie with one another in the arrangement of such delicacies as many of our wives and daughters are favorably known to make.

The products of the farm, orchard and garden are placed on our tables at the different meetings during the year, as an evidence of success or failure in any particular line. This is found to be an excellent guide to others following similar pursuits. Such varieties can be more closely examined and known as best withstanding the continuous rains, the prolonged drouths, the excessive heat or the severe cold. Such samples as possess good shipping qualities, are fine keepers, excellent for culinary purposes, and those that can be successfully and practically grown.

With over a hundred members and their families, much interest is manifested, and considerable good is believed to be accomplished.

The annual election of officers occurs in December.

Officers for 1900: President, Hon. J. C. Stevens; Vice-President, M. B. Test; Recording Secretary, Walter S. Ratliff; Treasurer, Jehu P. Norris; Corresponding Secretary, Hon. Joseph C. Ratliff; Executive Committee, Hon. J. C. Stevens, ex-officio, James Smith, Kate Ayler, Kate Scott, Nathan F. Garwood, Hannah C. Grave, Lizzie A. Moore and David Sutton.

As the members represent a diversified character of labor, effort is made to select essayists for the several sessions that will treat of such subjects as will particularly interest all at some time during the year. We have papers on "The Rose," "The Girl of the Farm," "The Farmer of Europe," "History of Agriculture," "The Fruit Grower," "Our Country Schools," "Neighbor With Your Plants," etc.

Within recent years, our organization unites with the Richmond Fair and Trotting Association to give an annual public fair, which was held September 25 to 29, east of the city. The attendance was good, but

Digitized by Google

inclement weather prevented many from going on Richmond day. Our Society had exclusive charge of the exhibits of seeds, grains, vegetables, fruits, flowers and culinary articles.

The Farmers' Institute that is annually held in our county, although not under our auspices, is ably assisted by our corps of members.

At the February meeting the annual dinner is held. A premium list is offered for the best viands that can be produced by our lady members, consisting of turkey, chicken, cakes, pies, bread, salads, butter, etc. After the awards are announced, the premium articles are placed on banquet tables, in an adjoining room, that are already loaded with eatables, and hundreds partake of the bountiful repast. There is doubtless nothing done during the year that so unites a good feeling among the members and assists so well in increasing the membership of the Society.

FRUITS.

It is to the credit of the farmer and gardener that there is gradually more promiscuous tree planting of the fruit bearing sorts. The gradual and inevitable destruction of our forests is dawning, and its influence on the future fruit industry is awaited with alarm. Forest and shade trees must be replaced where possible, new areas covered and better care taken of our present growing trees.

Apple.—The trees suffered severely in some localities from the severe cold of last winter. A profusion of bloom was seen everywhere, followed by a fair setting of young fruit, indicating a good crop. Summer apples were good, many varieties yielding well. The fall supply was shortened by the drouth, and prolonged period of hot weather. Too much fruit fell prematurely, requiring early marketing, while the supply of winter apples was but about 20 per cent. of an average yield. Fruit rotted on the trees and in cellars. The ravages of insect enemies were common everywhere. The scab and rust almost ruined many varieties that are usually clear of such attacks.

The San Jose scale has been found on the apple and plum trees in this county, and is feared to be the coming scourge of the country.

Pears.—A goodly number of the summer varieties were well laden and of good quality. The fall sorts did not mature so well, falling badly, mostly prematurely. Of the winter kinds, the Keiffer claims its share of attention, and is being more universally planted since the public has learned how to properly ripen its fruit. The varieties receiving the greatest favor in this locality are the Sheldon, Tyson, Anjou, Bartlett, Flemish Beauty, Clapp's Favorite, Sugar and Buffum.

The dreaded pear-tree blight has lessened the number of our older trees, but a surplus number is generally planted to counteract the loss from this disease.

Digitized by Google

Plum.—From the persistent attacks of the black knot on the plum trees, followed by the usual fatality to the tree, especially in cases where the tree is neglected, has resulted in plum culture gradually passing into disfavor. It is claimed by some enthusiasts that some varieties are much less liable to its ravages and that it can be held in check by the application of chemical compositions, but most persons are more or less skeptical regarding its treatment. Nurserymen are now engaged in growing seedling nursery stocks, with the hope of furnishing a tree that will meet the popular demand.

The advent of the sprayer has been a great boon to the culture of the plum and other small fruits, and it is hoped that it may be used more uniformly and systematically.

Peach.—The present peach crop was almost a failure in this section, although many protected trees in or near the city bore abundantly, with fruit of fair size and quality.

The bulk of our peach trees are usually found in our dooryards, although a few orchards exist among the possessions of some of our members.

Though strange, yet it is true, the general public is not partial to any particular variety, just so it is a freestone, of good size, rich color and of fine flavor.

Cherry.—The crop of this common fruit is generally fair, although an occasional season is seen when the trees are abundantly laden everywhere. The causes of such variations are usually atrributed to climatic conditions, but the proportionate yield of fruit to the number and activity of curculio and other insects can not be overlooked. The earlier blooming varieties apparently suffer most from their ravages. For this reason, the cultivation of the Governor Wood has been almost entirely abandoned.

The late Morelloes and the Montmorency sorts are being extensively planted. No new seedling cherry at present claims the attention of the fruit grower in this section.

Quince.—The severe weather ruined the bulk of our older bushes, many being entirely killed to the surface of the ground. This was particularly noticeable with those trees that were exposed to the west and northwest winds. The demand for quince fruit far exceeds the supply, largely due to the crop's uncertainty and the increasing popularity of the culinary dish known as "quince honey," which is made from the pulp of the quince apple.

Grape.—The keeper of the vineyard neglected his duty! The rewards of his labors are lessened and he is disheartened! Why is this? The severe winter killed back the vines, and together with the ravages of grape insects reduced the crop 50 per cent. Lovers of fine, compact

Digitized by Google

bunches of luscious grapes eat them now with some hesitancy, being fearful of eating the larvae of the grape-berry moth, a scourge that has but recently become so prevalent throughout eastern Indiana.

Amateur grape growers are apparently confining themselves to a few of the standard and better tested varieties, realizing that the later novelties doubtless do not possess sufficient merit and hardiness to diversify the grower's attention.

Strawberry.—The supply was insufficient to meet the demand, although the number of strawberry growers remains about the same.

Other Small Fruits.—The cultivation of the other small fruits is not done so extensively by single individuals, but by the public generally, who usually assign a portion of their garden spot to their cultivation.

The blackberry, although a fruit whose crop is rather uncertain, maintains its place in the culinary department in its season. Many persons use it and the dewberry in preference for pies and jams.

The black-cap raspberry is more generally sought and is considered better in many respects than the red varieties, although the latter are much in demand for table desserts and jellies.

The currant and gooseberry yields very largely according to the number of larvae eating the leaves of the bushes, as the plants are often defoliated before the grower is aware of it.

Ornithology.—The recent interest taken in our public schools and elsewhere in the study of our native birds and bird life will no doubt, eventually, result in incalculable benefit to the fruit growing industry of our country. Their habits, their nesting, their economic value and their migratory movements are better understood, and the pupils will thus early in life become better acquainted with our native fauna, and be better enabled to distinguish the beneficial from the nonbeneficial species. They can not but see the value of necessary protection, knowing that it fosters the development of agricultural and horticultural pursuits.

Under one of the divisions of the United States Department of Argiculture considerable effort has been made in the study of ornithology. Individual birds, almost without number, have been officially examined, dissected and arranged in tabulated groups, until the fundamental classification is well-nigh complete. The contents of the crop and stomach display unmistakably the quality and character of the food consumed by the living bird, and assists largely in determining the character and habitat of the different species.

WALTER S. RATLIFF,
Secretary.

Digitized by Google

NEIGHBOR WITH YOUR PLANTS.

[Read before the Wayne County Agricultural and Horticultural Society.]

BY ISHAM SEDGWICK.

It was years ago the query was propounded, "Who is my neighbor?" That same little question has been the theme of many sermons. In a manner it is my text now. Some thirty years ago I wrote a thesis in which I held the theory that there was a spirit intelligence in every individual, no matter what its kingdom. Some of my good friends, who had the authority to criticize that thesis, said that it was a fine piece of imagination, but was inconsistent. After it was returned to me I read it again and criticized it myself and tried long and hard to find wherein it was inconsistent. It finally dawned on me that it was inconsistent with the critic's peculiar religious opinions. Now it may be that you will find in this some points that you may on the same grounds regard inconsistent. If so, just ponder over it awhile and see where the view comes from.

To neighbor with your plants means more than you are likely to imagine at first thought. I know that many of you religiously use the plow and the hoe, and you scatter out the manure that has accumulated around the barn as much perhaps to get rid of it there as with the idea that you are really doing a kindness to the field. And there are some old fellows here that in the earlier days of labor were glad to see the last shovelful loaded on the wagon and drawn to the field, for it meant to them that there was no more labor of that kind till the next year. I remember when I first moved to the rich farm, then largely a swamp, that after I had put out all the manure of two or three years' accumulation on fields that my neighbors thought already rich, one of them said, "Don't you want to clean up my lot, too?" and was exceedingly astonished to see me with the wagon at that pile as soon as I could drive there. He never told me to get his pile again after he saw the crops I raised.

But I did not take this theme in order to provoke a series of old tales. I come to it with really serious intentions. I assert as a starting point that there is really a spirit intelligence in every plant that grows, and further assert that it is possible to get in touch with that spirit.

This is not the time to read a special dissertation to prove that assertion. You will, however, expect that facts may be cited in order that you may not be thought visionary because you attempt to neighbor with your plants. Note this one. When first the plow stirred the soil around a large poplar that stood near West River head it touched a large root close to the tree, and each succeeding furrow touched that root until it

Digitized by Google

had traced the root more than 150 feet to where it spread out for feed in a moist piece of rich earth moistened by a spring. On what other theory can you base the action of that tree save that in its spirit intelligence it directed the deposit of the particles that built that root. By some method it discovered the supply of food and sent out for it by the best means at its command.

Every plant will do that same thing, because it has the intelligence to direct powers to that end. You may say that this is simply the selfish action of the plant. Certainly it is the action of the plant to fulfill its destiny and to reproduce its kind. All plants do that and many of them do much more. It is these that do more that command attention. Why do they do it? If every man could answer his own questions I should perhaps give you an undisputed answer to this. There is no doubt a satisfactory answer, and one that is at least partly satisfactory is that it is an attempt to do justice to its neighbor. It is an effort to be responsive to the calls of its neighbors. Is it not a beautiful theory that plants are responsive in their efforts to repay the kindness coming to them?

It has been said that the plant shall produce seed after its own kind. It is true that they do it, and it is equally true that they do more. Were it not there would be no development to better things. The common crab-apple or the common red haw produce seed after their kind. From these and some kindred species not common here have been produced all those fine varieties that to-day go so far to make up the table delicacies of our kind.

How has this been done? Do you know? Oh! You will say that it has been done by cultivation? Has it? How? Which of you can take a crab apple seed and produce more than a crab? Which of you can take a wild rose and from it grow an American Beauty? Which of you can take the little tuber of Peru and produce a large table potato? It can be done, and it has been done. Will you tell me how? There are many nations on this earth. They speak in many strange tongues. If one of you were suddenly dropped down in one of these strange tribes you might not be able to communicate. You would likely be misunderstood more than understood. Yet you were only dropped in another tribe of your own kind. You should therefore expect it to be still more difficult to understand or communicate with other species.

You have made pretty fair progress with some other species. You often find that you can nearly talk to your dog understandingly. You have been able to teach him some of your language and some of your habits and have come on terms of good fellowship with him. You have made him your neighbor.

Digitized by Google

You, as the supposed superior being, have been able possibly to teach him more than he has been able to teach you.

The analogy will hold good as to plants. Each plant has its grade of capacity. What matter if some of them seem so limited? The germ of mind is still there and it may answer in its way. It will respond to the neighbor spirit. Many have responded to the higher thought of man.

I have read a little story of a bishop that stood high in the great Catholic church and in his zeal for the cause of his church and religion found himself far off in the grand Himalayan Mountains. He was there taken in charge by some of the master Hindoo magi and initiated in their mysteries. He was there taught that wondrous story of the auras. Taught that each particle of matter of whatever kind had its aura or sphere of influence and its own peculiar kind of influence, and that each aura was subject to the influence of all those in or touching the aura of others. It is a beautiful idea, teaching as it does the brotherhood of all things.

But it is not necessary to go to the far India to learn the same very beautiful lessons. Our gardens and our fields are as surely possessed of the auras or spirits of the plants in them as are those of any lands.

What I mean by all these drifting thoughts is that it is possible for you in a manner at least to neighbor with your plants. Inasmuch as it has been taught that to neighbor is to love and make that love known we can now get more directly to the subject.

It is desirable to get in touch with your plants. Every one of you can find some one of your human neighbors who has phenomenal success with some certain plants. One can grow fine roses and another fine cabbages.

One can grow beautiful apples and another grand potatoes. And some of you can so teach others and instill in them the art till they can grow the same plants that succeed so well with you.

Your horticultural papers teem with lucid dissertations on how to select the soil, how to fertilize, how to plant, and how to cultivate, and how to prune, and yet, after you have done all this, there is some subtle power or way about some one of those who follow exactly the same instructions and that power or way produces a better result than others.

And the same one may take two seeds and give them equal care so far as in their power lies and yet there will be a great difference in the results. The two seeds having the same parentage refuse to produce the same results.

Ah, but did you treat the plants the same? When in your culture did you hold the same good thought and wish while tilling one that you did in your service to the other. With knife in hand you may stand at

Digitized by Google

one young tree and cut off a limb here and another there, watching that you leave a bud here and another there so as to direct the plant in its growth, and then you stand by another and find that it has had a different idea in its growth and find that idea was at variance with your idea, and you begin with a different tone toward that tree, and you cut with a little more energy or a different spirit, and may hap with some resentment that it did not do better, and that tree has not had the affection and love that you gave the other, and it does not respond with the same effort that is given by the first.

I assure you that there is more in this than you may at first think.

I know a case in which the longing and constant wishes of a lady who gave close and careful attention to a slip cut from a single pink oleander was rewarded by that tree in its giving double and white flowers. That was regarded by the florist as a sport. Yet that sport was perpetuated.

A gentleman cultivating a beautiful rose often admired it and yet at the same time wished that he could only add to it the golden glow of the sunset, and that plant sent out a sport that had the red of the sunset mingled in the shading of its petals. He was a neighbor with the rose and it responded, and the lady was neighboring with the oleander and it responded to her wish.

Men have sat by their plants hybridizing and cross fertilizing and all the time with intense thought of the kind of flower wanted and have had their fondest hopes realized. Because the result has not always been good is not an argument against the theory, for none of you can know the thoughts or ideas of the different workers or which of them came in touch with the spirit of his plants. Some of you will smile at this theory, and I have no means of knowing that you may not even consider it a dream, yet there is in it a reality and a beauty as charming as the roses that have responded to the love of their neighbors.

I shall not make this a long paper for the reason that it is better to have one beautiful and true thought deeply planted in the hearts of my hearers than it is to tire them by a repetition.

The lesson that I would have you learn is not that you always, when planting your seed, have in mind the dollars and cents that the crop will bring. I want you to come into close communion with the plants under your care. I want you to love them so that it is a pleasure and not a task to labor with them. That you bring them the fertilizing feed with the same pleasure that you take their luscious fruits to your own table. There is joy in your labors when it is well understood that your plant is waiting with joy for your coming and responds with pleasure to your desires. Is it not a beautiful thought that your ideal of the fruit

Digitized by Google

that is to grow may be seen by the spirit of the tree and followed by its efforts to so place the atoms of the food that you have given in the form you have also presented?

We have ideals of fruits, but there are only few of us who have a different or better ideal than we have seen produced. Not many of us have ever with loving hands planted the appleseed and cared for the tree with the spirit of love always present and at the same time with the ideal apple in our mind and faith that we could thereby add to the beauty or goodness of the product of that tree. This idea may and possibly is sometimes carried out. Fortunately it more often happens that an approach to the ideal conditions comes with the eating of a luscious apple, and under its inspiration the seed of it is planted.

It requires more than the life of one of our species to produce really grand results. It is a good thing that there have been grand men and women scattered through the ages of the past and that each of them in their day and time have been neighbor to their plants. The cumulative effect of this is seen to-day in the great progress that has been made in all lines. Some of our horticulturists have recently wrought wonders in the apparent improvements made in plants and fruits and flowers. They are now neighbors to the plants that have been nurtured and loved in the past.

These have learned something of the love of mankind and have to the extent of their ability responded to his wants. These cultured ones are more moved to respond now to the one who neighbors with them than were their ancestry that had to battle for their lives. Don't think but what these battles have been for the good of all. There is not a weed but has done its share toward the building of the earth. There has been an inspiration in and behind the efforts of all living things, and each has had its place and its power, and the records of its work occupy some little corner in the records of creation. We may not see the harmony of all this, but it is in the plan of development. Surely these are the best days and the best of all the earth is now here. It is time to cultivate the spirit of communion with the individualities of all things that surround us and to us, who love the fruits and flowers, it is time to neighbor with our plants.

Let us bear testimony and pay tribute to that odd little people away over in Japan that have wrought some wonders in the plant world. They made gods of their plants and worshiped them. Possibly it was thus that they came so closely in touch with the spirits of the plants that their wishes were intelligibly presented to the plants and, in the long years of such love and worship there was a communion of spirits

Digitized by Google

that led to the production of such wonderfully good things praised by all peoples.

No doubt we have more to learn than we have learned. We may venerate the wisdom of our fathers and praise the Father of all spirits that his greatest creation, the spirit of love, is not confined to the spirits of men, but has a home in the hearts of the plants as well. A broader view may lead us to neighbor with our plants. It may lead us to yet higher ideals and give us the power to impress the highest ideals on the spirits of our plants. The poetry of the universe runs in the rhythm of love and its lines lead in harmony to the spirits of all life. Is it not a sweet poetic dream that you can and do neighbor with your plants?

Digitized by Google

Digitized by Google

INDEX.

PAGE

Aesthetics in Horticulture, a paper..... 11
Anderson, W. L., remarks by..... 172
Awards to Indiana Fruits at Paris Exposition..... 173

Barlow, Hon. J. M., Welcome Address by..... 2
Barlow, Hon. J. M., remarks by..... 6
Berryman, Mrs. W. L., paper by..... 105
Burrill, Dr. T. J., paper by..... 84
Burrill, Dr. T. J., remarks by.....96, 97, 98, 99, 125, 126, 132
Burton, Joe A., papers by.....43, 119
Burton, Joe A., remarks by.....23, 31, 32, 63, 64, 65, 66, 75, 76, 80, 97, 126, 134, 151, 152, 164, 166
Burton, Joe A., report as Superintendent of Experimental Orchard.... 62
Burris, J. B., paper by..... 47
Burris, J. B., remarks by.....34, 50

Campbell, Geo. P., report as Vice-President..... 152
Campbell, Geo. P., remarks by.....96, 169
Clore, J. R., remarks by..... 141
Coburn, John, remarks by..... 66
Committee on Experimental Orchard..... 173
Committee on Revision of Premium List..... 46
Committee on Awards, report of..... 135
Committee on Finance, report of..... 167
Committee on Resolutions, report of..... 167
Constitution and By-Laws..... vii
Conditions Affecting Apple Growing in the Gas Belt..... 105
Crossing and Hybridizing..... 99
Concord Grape Vine, the Original Vine..... 182

Davis, C. E., remarks by.....7, 29, 65, 131, 148, 151, 166, 172
Delegate to American Pomological Society..... 108
De Vilbiss, Mrs., remarks by..... 8
Dorner, Fred, paper by..... 99

Education for the Horticulturist, by President W. E. Stone..... 81
Experimental Orchard, Committee on..... 173

Flanners, F. W., remarks by..... 9
Fletcher, Calvin, remarks by..... 139
Flick, W. B., paper by..... 126
Flick, W. B., remarks by.....32, 44, 130, 131

Digitized by Google

PAGE
Garretson, Amos, report as Vice-President..... 146
Garretson, Amos, remarks by.....6, 40, 108, 115, 118
Green, Prof. W. J., paper by..... 110
Green, Prof. W. J., remarks by.....113, 115, 118, 132, 135
Grossman, J. C., paper by..... 132
Grossman, J. C., report as Vice-President..... 142
Grossman, J. C., remarks by..... 39

Hale, H. J., remarks by..... 9
Harvesting and Marketing Fruit..... 132
Henby, J. K., remarks by.....64, 129, 131, 151, 170, 171
Henry, H. W., remarks by.....8, 41, 77, 135, 170
Hobbs, C. M., remarks by.....29, 30, 41, 64, 76, 125, 150, 163, 164, 171
Hobbs, C. M., paper by..... 24
Horticulture—Its Relation to the Country Home..... 3
Howland, C. A., remarks by.....71, 73, 74

Johnson, S., Response to Welcome Address..... 2
Johnson, S., report as Treasurer..... 61
Johnson, S., remarks by.....23, 40, 41, 46, 118, 128, 139, 148, 164

Kingsbury, J. G., remarks by.....11, 13, 40, 73, 124, 139

Latta, W. C., paper by..... 33
Latta, W. C., remarks by.....10, 20, 23, 29, 30
List of Members..... xi
List of Varieties of Fruits..... 178
List of Indiana Nurserymen..... 190
Little, Jas., remarks by.....10, 24, 130, 131, 138, 141, 142

Map, Showing Fruit Districts of the State..... 177
Members of the Society..... xi
Millhouse, J. J., remarks by..... 74
Morgan, John, remarks by..... 45

Neicewander, J. D., paper by..... 35
Neicewander, J. D., remarks by..... 40
"Neighbor With Your Plants," a paper..... 210
Newlin, C. E., paper by..... 182

Officers of the Society..... v
Officers Elected for 1901..... 173
Our Needs for the Future..... 66

Papers by—
Prof. W. J. Green..... 110
W. B. Flick..... 126
J. C. Grossman..... 132
Prof. L. R. Taft..... 153
John Tilson 167
A. A. Parsons..... 3
Isham Sedgwick 210

Digitized by Google

PAGE

Mrs. Dr. John Ragan 11
C. M. Hobbs 24
W. C. Latta (abstract) 33
Rev. Wm. Talbert 42
Joe A. Burton 43, 119
J. B. Burris 47
H. H. Swaim 78
President W. E. Stone 81
Dr. T. J. Burrill 84
Fred Dorner 99
Mrs. W. L. Berryman 105
President's Address 55
Phelps, Mr., remarks by 141, 149
Place of Small Fruits in the Economy of the Farm 167
Place of the Apple Orchard in the Economy of the Farm 78
Preston, Dr., remarks by 97, 149, 150
Proceedings of Annual Meeting 55
Pruning and Thinning a Bearing Orchard 126

Ragan, Mrs. Dr., paper by 11
Ragan, W. H., remarks by 41, 52
Ratliff, W. S., remarks by 7, 30, 32
Reed, W. C., report as Delegate 198
Reed, W. C., remarks by 64, 99, 170
Reports of Committees on—
Awards 50, 135
Resolutions 51, 167
Finance 167
Revision of Rules 152
Reports of—
Secretary and Treasurer 59
Delegate to Missouri Horticultural Society 198
Superintendent of Experimental Orchard 62
County Horticultural Societies 202
State Entomologist 184
Vice-President First District 137
Vice-President Second District 152
Vice-President Third District 146
Vice-President Fourth District 142
Root-rot, Discussion on 64, 65

Sedgwick, Isham, paper by 210
Simpson, H. D., remarks by 135, 165, 166
Small Fruits for the Farmer 42
Some Good Flowering Shrubs 24
Some Phases of Horticulture as Seen in a Trip Around the World 47
Stevens, Mrs. W. W., paper by 14
Stevens, Mrs. W. W., report as Vice-President 137
Stevens, Mrs. W. W., remarks by 6, 23, 46, 80, 118, 124, 171
Stevens, J. C., remarks by 41, 121

Digitized by Google

PAGE
Stone, President W. E., paper by..... 81
Swaim, H. H., paper by..... 78
Swaim, H. H., remarks by.....80, 171

Taft, Prof. L. R., paper by..... 153
Taft, Prof. L. R., remarks by.....120, 121, 160, 161, 162, 163, 164, 165
Talbert, Rev. Wm., paper by..... 42
Talbert, Rev. Wm., remarks by..... 46
Teas, E. Y., remarks by.....30, 40, 50, 150
Trees and Their Uses, by Mrs. W. W. Stevens..... 14
The Growing of Fancy Strawberries..... 35
The Exhibition Apple..... 43
The Botany of the Apple..... 84
The Original Concord Grape Vine..... 182
The Philosophy of Spraying..... 153
The Apple Orchard from Ten to Fifty Years..... 119
Thomas Snead, remarks by.....64, 74, 130, 134, 170
Troop, Prof. J., report as Secretary..... 59
Troop, Prof. J., report as State Entomologst..... 184
Troop, Prof. J., remarks by.....32, 41, 45, 172

Van Deman, H. E., remarks by.....110, 113, 118, 122, 125, 130, 131, 134, 135, 140, 149, 151, 160, 161, 162, 165

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

UNIVERSITY OF MICHIGAN
3 9015 06720 0108

Digitized by Google

Digitized by Google